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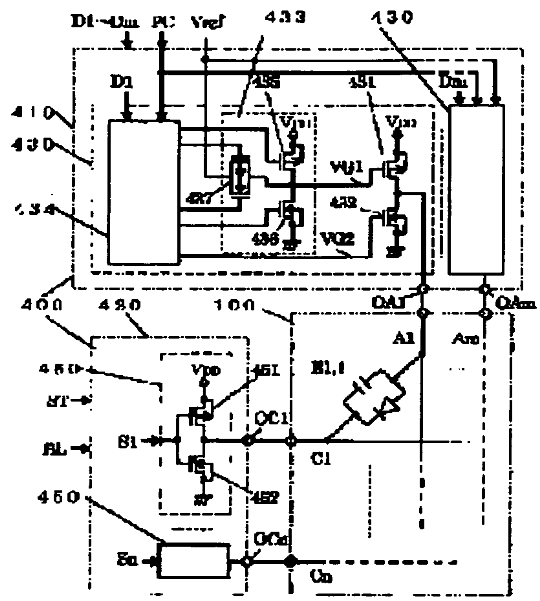
(54) METHOD AND DEVICE FOR DRIVING ORGANIC EL DISPLAY DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a method and device for driving an organic EL display device decreased in a rise time from constant current driving up to light emission.
SOLUTION: A cathode driver 420 to be connected with cathode lines C1-Cn of the organic EL panel synchronizes the fall and rise of its pulse with those of a blanking signal BL, and line-sequentially scans each cathode line by supplying the ground potential thereto from each output circuit 450 based on the line sequential scanning signals S1-Sn having a blanking period. Moreover, an anode driver 410 to be connected with anode lines Al-Am performs large current control of an output circuit 430 connected with the anode lines to be driven with a constant current at the time of the next scanning based on a large current control signal PC synchronizing the rise of its pulse with that of the blanking signal before the scanning. This pulse is to be set so that its width is narrower than that of the blanking signal, and the potential of the output terminal OA1 is a little lower than that of the forward voltage VF1 of the organic EL element at which the organic EL element can be made to emit with a desired brightness, at the falling point of the pulse of the large current control signal PC.



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CLAIMS

[Claim(s)]

[Claim 1] Make the cathode rays of an organic EL panel line sequential from power-source potential by the cathode driver at touch-down potential, scan, and the anode rays of the arbitration of an organic EL panel are driven by constant current by the anode plate driver at each line sequential scan period. In the drive approach of the organic electroluminescence display of a simple matrix drive method of making the organic EL device of the arbitration contained in an organic EL panel emitting light by desired brightness The drive approach of the organic electroluminescence display characterized by driving the anode rays which establish a blanking period between said each scan period, and are driven by constant current at the scan period immediately after each of this blanking period by the larger high current than said constant current at said each blanking period.

[Claim 2] The drive approach of the organic electroluminescence display according to claim 1 characterized by the thing by which it is the potential of the anode rays driven by constant current at the scan period immediately after said each blanking period at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request, and which is driven by said high current so that it may become.

[Claim 3] The drive approach of an organic electroluminescence display according to claim 1 or 2 that the change time to the drive of constant current from said high current was characterized by being a front [time / of each of said blanking period / termination].

[Claim 4] The drive approach of the organic electroluminescence display one publication in claim 1 to which the initiation time of the drive by said high current was characterized by being the same as that of the initiation time of each of said blanking period thru/or claim 3.

[Claim 5] The drive approach of the organic electroluminescence display one publication in claim 1 which the drive by said high current receives the anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after said each blanking period, is a chisel, and was characterized by driving by the drive period in said high current, and said constant current to the anode rays driven by constant current at the last scan period thru/or claim 4.

[Claim 6] The drive approach of the organic electroluminescence display one publication in claim 1 characterized by starting it once it is the drive by said high current at the initiation time of each of said blanking period and it makes potential of the anode rays driven by constant current at the scan period immediately after said each blanking period touch-down potential thru/or claim 3.

[Claim 7] The cathode driver which scans from power-source potential by carrying out the cathode rays of an organic EL panel to touch-down potential line sequential, In the driving gear of the organic electroluminescence indicating equipment of the simple matrix drive method which makes the organic EL device of the arbitration which possesses the anode plate driver which drives the anode rays of the arbitration of an organic EL panel by constant current at each said line sequential scan period, and is contained in an organic EL panel emit light by desired brightness said cathode driver While establishing and scanning a blanking period between said each scan period The driving gear of the organic electroluminescence display with which said anode plate driver was characterized by driving the anode rays driven by constant current at the scan period immediately after said each blanking period by the larger high current than said constant current at said each blanking period.

[Claim 8] The driving gear of the organic electroluminescence display according to claim 7 characterized by said anode plate driver having high current control and the PURIDORAIBA section which carries out constant current control for the transistor for an output which supplies said high current and constant current, and this output transistor.

[Claim 9] The driving gear of the organic electroluminescence display according to claim 7 or 8 characterized by the thing by which it is the potential of the anode rays which said anode plate driver drives by constant current at each [said] scan period after direct at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request, and which is driven by said high current so that it may become.

[Claim 10] The driving gear of the organic electroluminescence display of one publication in claim 7 to which said anode plate driver was characterized by changing from said high current to the drive of constant current before the termination time of each of said blanking period thru/or claim 9.
[Claim 11] The driving gear of the organic electroluminescence display of one publication in claim 7 to which said anode plate driver was characterized by starting the drive by said high current to initiation and coincidence of each of said blanking period thru/or claim 10.
[Claim 12] The driving gear of the organic electroluminescence display of one publication in claim 7 characterized by driving by the drive period in said high current, and said constant current to the anode rays which said anode plate driver drove by said high current only to the anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at each [said] scan period after direct, and drove by constant current at the last scan period thru/or claim 11.
[Claim 13] The driving gear of the organic electroluminescence display of one publication in claim 7 characterized by starting the drive by said high current once it is said anode plate driver at the initiation time of each of said blanking period and it makes potential of the anode rays driven by constant current at each [said] scan period after direct touch-down potential thru/or claim 10.
[Claim 14] The driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential, The MOS transistor for a P channel mold output which a CMOS configuration is carried out by this MOS transistor for an N channel mold output, and supplies said high current and constant current, The PURIDORAIBA section which controls the gate of said MOS transistor for a P channel mold output, The driving gear of the organic electroluminescence display of one publication in claim 7 characterized by having the control section which controls the gate and said PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal thru/or claim 13.
[Claim 15] The driving gear of the organic electroluminescence display according to claim 14 characterized by said PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential.
[Claim 16] The driving gear of the organic electroluminescence display of one publication in claim 7 characterized by said anode plate driver driving by the constant current corresponding to the k-th power gradation display of 2 in order that 2 may indicate said organic EL panel by gradation the k-th power thru/or claim 13.
[Claim 17] The k-bit driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential with a CMOS configuration, and the MOS transistor for a P channel mold output of the k piece juxtaposition which supplies said high current and constant current, The k PURIDORAIBA sections which control the gate of said MOS transistor for a P channel each mold output, The driving gear of the organic electroluminescence display according to claim 16 characterized by having the control section which controls the gate and said each PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal.
[Claim 18] The driving gear of the organic electroluminescence display according to claim 17 characterized by said each PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the drive approach of the organic electroluminescence (electroluminescence) display of a passive matrix, and a driving gear.
[0002]
[Description of the Prior Art] The organic electroluminescence display of a passive matrix consists of an organic EL panel 100 and a driving gear 200 which drives this organic EL panel 100, as shown in drawing 9 . An organic EL panel 100 is the structure in which the matrix-like pixel was formed, as the organic EL device E1 whose organic thin film is pinched on a glass substrate by cathode-rays C1 -Cn which consists of anode-rays A1 -Am which consists of a transparent electrode, and a metal electrode and by which an equal circuit is expressed with diode and the parasitic capacitance by which parallel connection was carried out to this in the intersection of a two-electrodes line, 1 -Em, and n. The driving gear 200 consists of an anode plate driver 210 by which electrical installation is carried out to anode-rays A1 -Am, and a cathode driver 220 by which electrical installation is carried out to cathode-rays C1 -Cn. While scanning cathode-rays C1 -Cn to line sequential with a fixed time interval by the cathode driver 220, it is made to make the organic EL devices Ei and j of the intersection location of arbitration emit light by driving anode-rays A1 -Am by the anode plate driver 210 at this scan period.
[0003] Next, the conventional driving gear 300 as a driving gear 200 is explained with reference to drawing 10 and drawing 11 . In drawing 10 , a driving gear 300 consists of an anode plate driver 310 and a cathode driver 320. The anode plate driver 310 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am It has m output circuits 330 which supply the constant current IF 1 which can make each output terminals OA1-OAm emit light based on driving signals D1-Dm by the brightness of a request of an organic EL device E1, 1-Em, and n, or the touch-down potential which carries out a luminescence halt. the cathode driver 320 -- an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 350 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-Sn. In addition, driving signals D1-Dm are serially supplied to the anode plate driver 310 from the exterior, and the level conversion of them is carried out and they are supplied to an output circuit 330 while being changed into parallel in the circuit which is not illustrated in the anode plate driver 310. Moreover, start signal ST is supplied to the cathode driver 320 from the exterior, the level conversion of them is carried out and the scan signals S1-Sn are supplied to an output circuit 350 while they are changed into a pulse sequential in the circuit which is not illustrated in the cathode driver 320. Only the output circuit 330 where each output circuit 330,350 was connected to the output terminal OA 1, and the output circuit 350 connected to the output terminal OC 1 illustrate circuitry, and other output circuits 330,350 are the same circuitry, and are omitting illustration.
[0004] The output circuit 330 connected to the output terminal OA 1 MOS transistor 331 for a P channel mold output and MOS transistor 332 for an N channel mold output of a CMOS configuration which supply constant current IF 1 and touch-down potential, MOS transistor 333 for P channel mold control which connects the gate of MOS transistor 331 to the power-source potential VDD in order to carry out off control of MOS transistor 331, The transfer gate 334 which connects the gate potential VG 1 of MOS transistor 331 to a reference potential Vref in order to carry out constant current control of MOS transistor 331, It has the inverter 335 which is made to reverse a driving signal D1 and is supplied to the gate of MOS transistor 332, and the gate by the side of the P channel of the transfer gate 334. A driving signal D1 is directly supplied to the gate of MOS transistor 333, and the gate by the side of the N channel of the transfer gate 334.
[0005] The output circuit 350 connected to the output terminal OC 1 has MOS transistor 351 for a P channel mold output of a CMOS inverter configuration and MOS transistor 352 for an N channel mold output which supply the power-source potential VDD and touch-down potential, and the scan signal S1 is directly supplied to these gates.
[0006] The drive approach of the organic EL panel 100 by the driving gear 300 is explained. From the exterior,

driving signals D1-Dm are supplied to the anode plate driver 310, and start signal ST is supplied to the cathode driver 320. If start signal ST is supplied to the cathode driver 320 from the exterior, the scan signals S1-Sn will be supplied to n output circuits 350 line sequential from the circuit which is not illustrated in the cathode driver 320. If driving signals D1-Dm are supplied to the anode plate driver 310 at this time, the driving signals D1-Dm changed into parallel in the circuit which is not illustrated in the anode plate driver 310 will be supplied to m output circuits 330, respectively for every supply of the pulse of each scan signals S1-Sn.
[0007] Hereafter, drawing 11 is used together and explained about actuation of the output circuit 330 connected to the output terminal OA 1, and the output circuit 350 connected to the output terminal OC 1, assuming even the phase after being scanned from the phase before cathode rays C1 are scanned to be what anode rays A1 did not drive in the phase of order.
[0008] First, it is a scan phase by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 350, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 351 is [off control of ON control and MOS transistor 352 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. A driving signal D1 is touch-down potential level, in this phase, in an output circuit 330, while ON control of MOS transistor 333 is carried out, off control of the transfer gate 334 is carried out, the gate potential VG 1 of MOS transistor 331 is [power-source potential VDD level and the gate potential VG 2 of MOS transistor 332] power-source potential VDD level, ON control of off control and MOS transistor 332 is carried out for MOS transistor 331, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.
[0009] Next, if the scan signal S1 currently supplied to the output circuit 350 changes to power-source potential VDD level, while off control of MOS transistor 351 is carried out, ON control of MOS transistor 352 will be carried out, and an output terminal OC 1 will change to touch-down potential level. In addition, output terminals OC2-OCn other than output terminal OC1 are power-source potential VDD level at this time. It synchronizes with changing, and if this driving signal D1 currently supplied to the output circuit 330 changes to power-source potential VDD level, while ON control of off control and the transfer gate 334 will be carried out for MOS transistor 333 and the gate potential VG 1 of MOS transistor 331 will change to reference potential Vref level, the gate potential VG 2 of MOS transistor 332 changes to touch-down potential level, off control of constant current control and MOS transistor 332 is carried out for MOS transistor 331, and constant current IF 1 is supplied from an output terminal OA 1. the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- discharging -- further -- organic EL device E -- the parasitic capacitance of 1 and 1 charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF1 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness.
[0010] Next, if the scan signal S1 currently supplied to the output circuit 350 in the scan phase by the cathode rays C2 after one changes to touch-down potential level by the line sequential by which cathode rays C1 were scanned, while ON control of MOS transistor 351 is carried out, off control of MOS transistor 352 will be carried out, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. If this driving signal D1 that synchronizes with changing and is supplied to the output circuit 330 changes to touch-down potential level While off control of ON control and the transfer gate 334 is carried out for MOS transistor 333 and the gate potential VG 1 of MOS transistor 331 changes to power-source potential VDD level the gate potential VG 2 of MOS transistor 332 changes to power-source potential VDD level, ON control of off control and MOS transistor 332 is carried out for MOS transistor 331, and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- luminescence of 1 and 1 is stopped. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.
[0011] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, each organic EL device of two or more locations of arbitration is operated by driving the anode rays of arbitration for every scan among anode rays A1-Am as if it was emitting light to coincidence.
[0012]
[Problem(s) to be Solved by the Invention] By the way, the above-mentioned driving gear 300 is a scan phase by another cathode rays in front of one in the line sequential by which a certain cathode rays are scanned as

mentioned above, and the parasitic capacitance of the organic EL device connected to cathode rays other than the cathode rays scanned among the organic EL devices connected to the anode rays which are not driven in this phase is charged to hard flow. When making the organic EL device which scanned a certain cathode rays and was connected to the front anode rays which were not being driven in a phase and these cathode rays in the next phase emit light, For example, if it drives by constant current IF 1 as the current from an output terminal OA 1 is shown in drawing 11 The parasitic capacitance of the organic EL device charged to the hard flow connected to the cathode rays which were not scanned in the front phase among the organic EL devices connected to these anode rays discharges by this constant current IF 1. Since the parasitic capacitance of the organic EL device furthermore scanned among these organic EL devices is charged by this constant current IF 1 in the forward direction, As the potential of an output terminal OA 1 is shown in drawing 11 , the potential of the output terminal of the driving gear 300 connected to anode rays Since starting even to the potential of the forward voltage VF1 of the diode characteristics of the organic EL device scanned took time amount and luminescence time amount became short, there was a problem that the brightness of organic EL panel 100 original was not obtained.

[0013] Therefore, it was made in order that this invention might solve the above-mentioned trouble, and it aims at offering the driving gear of the organic electroluminescence display which shortened time amount to luminescence in a scan period by discharging quickly the parasitic capacitance with which the organic EL device by which the high current was connected to the anode rays driven by the next scan at the blanking period between scans at the anode rays of a predetermined time sink lever was reverse-charged.

[0014]

[Means for Solving the Problem] (1) The drive approach of the organic electroluminescence display concerning this invention Make the cathode rays of an organic EL panel line sequential from power-source potential by the cathode driver at touch-down potential, scan, and the anode rays of the arbitration of an organic EL panel are driven by constant current by the anode plate driver at each line sequential scan period. In the drive approach of the organic electroluminescence display of a simple matrix drive method of making the organic EL device of the arbitration contained in an organic EL panel emitting light by desired brightness A blanking period is established between said each scan period, and it is characterized by driving the anode rays driven by constant current at the scan period immediately after each of this blanking period by the larger high current than said constant current at said each blanking period. According to the above-mentioned means, the anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends.

(2) The drive approach of the organic electroluminescence indicating equipment concerning this invention is characterized by the thing by which it is the potential of the anode rays driven by constant current at the scan period immediately after said each blanking period at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request and which is driven by said high current so that it may become in the above-mentioned (1) term. According to the above-mentioned means, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(3) The drive approach of the organic electroluminescence display concerning this invention is characterized by the change time to the drive of constant current from said high current being a front [time / of each of said blanking period / termination] in the above-mentioned (1) term or (2) terms. According to the above-mentioned means, even if the change to the drive of constant current from a high current is overdue, by the time the cathode-rays side of the organic EL device connected to the cathode rays scanned becomes touch-down potential, the drive of a high current will be ended, and an organic EL device should not drive by the high current.

(4) It is characterized by the initiation time of the drive by said high current of the drive approach of the organic electroluminescence display concerning this invention being the same as the initiation time of each of said blanking period in one of the above-mentioned (1) term thru/or (3) terms.

(5) The drive approach of the organic electroluminescence display concerning this invention In one of the above-

mentioned (1) term thru/or (4) terms the drive by said high current The anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after said each blanking period are received, and it is a chisel. It is characterized by driving by the drive period in said high current, and said constant current at the last scan period to the anode rays driven by constant current. As opposed to the anode rays which were driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period according to the above-mentioned means Since it does not drive by the high current but drives by constant current, it is at the termination time of a blanking period. When it drives according to constant current at the scan period immediately after a blanking period still in the state when driving the potential of these anode rays by constant current, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(6) The drive approach of the organic electroluminescence display concerning this invention is characterized by starting it, once it is the drive by said high current at the initiation time of each of said blanking period and it makes potential of the anode rays driven by constant current at the scan period immediately after said each blanking period touch-down potential in one of the above-mentioned (1) term thru/or (3) terms. According to the above-mentioned means, it is the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.

(7) The driving gear of the organic electroluminescence display concerning this invention The cathode driver which scans from power-source potential by carrying out the cathode rays of an organic EL panel to touch-down potential line sequential, In the driving gear of the organic electroluminescence indicating equipment of the simple matrix drive method which makes the organic EL device of the arbitration which possesses the anode plate driver which drives the anode rays of the arbitration of an organic EL panel by constant current at each said line sequential scan period, and is contained in an organic EL panel emit light by desired brightness said cathode driver While establishing and scanning a blanking period between said each scan period, said anode plate driver is characterized by driving the anode rays driven by constant current at the scan period immediately after said each blanking period by the larger high current than said constant current at said each blanking period. According to the above-mentioned means, the anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends.

(8) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by said anode plate driver having high current control and the PURIDORAIBA section which carries out constant current control for the transistor for an output which supplies said high current and constant current, and this output transistor in the above-mentioned (7) term. According to the above-mentioned means, both drives of a high current and constant current can be performed only by changing the potential of the control terminal of the transistor for an output.

(9) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by the thing by which it is the potential of the anode rays which said anode plate driver drives by constant current at each [said] scan period after direct at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request and which is driven by said high current so that it may become in the above-mentioned (7) term or (8) terms. According to the above-mentioned means, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(10) It is characterized by said anode plate driver changing the driving gear of the organic electroluminescence display concerning this invention from said high current to the drive of constant current before the termination time of each of said blanking period in one of the above-mentioned (7) term thru/or (9) terms. According to the above-mentioned means, even if the change to the drive of constant current from a high current is overdue, by the time the cathode-rays side of the organic EL device connected to the cathode rays scanned becomes touch-down potential, the drive of a high current will be ended, and an organic EL device should not drive by the high current.
(11) The driving gear of the organic electroluminescence display concerning this invention is characterized by said anode plate driver starting the drive by said high current to initiation and coincidence of each of said blanking period in one of the above-mentioned (7) term thru/or (10) terms.
(12) The driving gear of the organic electroluminescence display concerning this invention In one of the above-mentioned (7) term thru/or (11) terms said anode plate driver It drives by said high current at the last scan period only to the anode rays which were not driven by constant current among the anode rays driven by constant current at each [said] scan period after direct. It is characterized by driving by the drive period in said high current, and said constant current at the last scan period to the anode rays driven by constant current. As opposed to the anode rays which were driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period according to the above-mentioned means Since it does not drive by the high current but drives by constant current, it is at the termination time of a blanking period. When it drives according to constant current at the scan period immediately after a blanking period still in the state when driving the potential of these anode rays by constant current, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.
(13) In one of the above-mentioned (7) term thru/or (10) terms, once it is the driving gear of the organic electroluminescence display concerning this invention at the initiation time of each of said blanking period and it makes potential of the anode rays which said anode plate driver drives by constant current at each [said] scan period after direct touch-down potential, it is characterized by starting the drive by said high current. According to the above-mentioned means, it is the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.
(14) The driving gear of the organic electroluminescence display concerning this invention The driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside in one of the above-mentioned (7) term thru/or (13) terms, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential, The MOS transistor for a P channel mold output which a CMOS configuration is carried out by this MOS transistor for an N channel mold output, and supplies said high current and constant current, It is characterized by having the PURIDORAIBA section which controls the gate of said MOS transistor for a P channel mold output, and the control section which controls the gate and said PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal.
(15) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by said PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential in the above-mentioned (7) term.
(16) In one of the above-mentioned (7) term thru/or (13) terms, as for the driving gear of the organic electroluminescence display concerning this invention, said anode plate driver is characterized by driving by the constant current corresponding to the k-th power gradation display of 2, in order that 2 may indicate said organic EL panel by gradation the k-th power.
(17) The driving gear of the organic electroluminescence display concerning this invention The k-bit driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside in the above-mentioned (16) term, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and

has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential with a CMOS configuration, and the MOS transistor for a P channel mold output of the k piece juxtaposition which supplies said high current and constant current, The k PURIDORAIBA sections which control the gate of said MOS transistor for a P channel each mold output, It is characterized by having the control section which controls the gate and said each PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal.
(18) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by said each PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential in the above-mentioned (17) term.
[0015]
[Embodiment of the Invention] Below, based on this invention, the drive approach of the organic electroluminescence display by the driving gear 400 and driving gear 400 of the 1st example as a driving gear 200 is explained with reference to drawing 1 thru/or drawing 3 . In drawing 1 , a driving gear 400 consists of an anode plate driver 410 and a cathode driver 420. The anode plate driver 410 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am Based on the high current control signal PC and driving signals D1-Dm, a high current or touch-down potential is supplied to each output terminals OA1-OAm during the blanking period during a scan. It has m output circuits 430 which supply constant current or touch-down potential throughout [scan term] based on driving signals D1-Dm. The cathode driver 420 an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 450 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-Sn. In addition, driving signals D1-Dm are serially supplied to the anode plate driver 410 from the exterior, are changed into parallel in the circuit which is not illustrated in the anode plate driver 410, and are supplied to an output circuit 430. Moreover, start signal ST and a blanking signal BL are supplied to the cathode driver 420 from the exterior, the level conversion of the scan signals S1-Sn is carried out, and they are supplied to an output circuit 450 while falling and the standup wave-like in a circuit which are not illustrated in the cathode driver 420 are changed into the sequential pulse which started with falling of a blanking signal BL, was alike, and synchronized, respectively. Only the output circuit 430 where each output circuit 430,450 was connected to the output terminal OA 1, and the output circuit 450 connected to the output terminal OC 1 illustrate circuitry, and other output circuits 430,450 are the same circuitry, and are omitting illustration.
[0016] The output circuit 430 connected to the output terminal OA 1 has MOS transistor 431 for a P channel mold output of a CMOS configuration and MOS transistor 432 for an N channel mold output which supply a high current or constant current, and touch-down potential, and the control section 434 which carries out logic processing of off control and high current control or the PURIDORAIBA section 433 for carrying out constant current control, and a driving signal D1 and the high-current control signal PC for MOS transistor 431, carries out the level conversion of the logic signal, and is supplied to the gate and the PURIDORAIBA section 433 of MOS transistor 432. The PURIDORAIBA section 433 MOS transistor 435 for P channel mold control and MOS transistor 436 for N channel mold control of a CMOS configuration which connect the gate of MOS transistor 431 to the power-source potential VDD or touch-down potential in order to off-control or high current control MOS transistor 431, It has the transfer gate 437 which connects the gate potential VG 1 of MOS transistor 431 to a reference potential Vref in order to carry out constant current control of MOS transistor 431. The signal from a control section 434 is supplied to each gate of MOS transistor 435,436 and the transfer gate 437.
[0017] The output circuit 450 connected to the output terminal OC 1 has P channel mold MOS transistor 451 and N channel mold MOS transistor 452 of a CMOS inverter configuration which supply the power-source potential VDD and touch-down potential based on the scan signal S1.
[0018] The drive approach of the organic EL panel 100 by the driving gear 400 is explained. From the exterior, start signal ST and a blanking signal BL are supplied to the cathode driver 420, and the high current control signal PC which has predetermined pulse width narrower than the pulse width of driving signals D1-Dm and a blanking signal BL in the anode plate driver 410 is supplied. If start signal ST and a blanking signal BL are supplied to the cathode driver 420 from the exterior, from the circuit which is not illustrated in the cathode driver 420, the scan signals S1-Sn with which the standup and falling of pulse shape started with falling of a blanking signal BL, were alike with the signals, and synchronized, respectively will keep the same blanking period as the pulse width of a blanking signal BL in n output circuits 450, and will be supplied to line sequential. If driving signals D1-Dm and the high current control signal PC are supplied to the anode plate driver 410 at this time, the high current control signal PC and the driving signals D1-Dm changed into parallel in the circuit which is not illustrated in the anode plate driver 410 will be supplied to m output circuits 430, respectively for every supply of the pulse of

each scan signals S1-Sn including a blanking period.
[0019] Drawing explaining the timing diagram of drawing 2 and the control state of each component of drawing 3 is used together and explained about actuation of the output circuit 430 hereafter connected to the output terminal OA 1, and the output circuit 450 connected to the output terminal OC 1, assuming even the phase after being scanned from the phase before cathode rays C1 are scanned to be what anode rays A1 did not drive in the phase of order.
[0020] First, it is a scan phase (this side of time of day t1) by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 450, a blanking signal BL is "L (low) level, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 451 is [off control of ON control and MOS transistor 452 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. In this phase, a driving signal D1 is ["L" level and the high current control signal PC] "L" level in an output circuit 430. With the signal from a control section 434 Off control of ON control, and MOS transistor 436 and the transfer gate 437 is carried out for MOS transistor 435 of the PURIDORAIBA section 433. The gate potential VG 1 of MOS transistor 431 on power-source potential VDD level Similarly, the gate potential VG 2 of MOS transistor 432 is power-source potential VDD level, ON control of off control and MOS transistor 432 is carried out for MOS transistor 431 by the signal from a control section 434, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.
[0021] Next, when time of day t1 comes, in an output circuit 450, a blanking signal BL changes to "H (yes)" level, and while off control of ON control and MOS transistor 452 was carried out for MOS transistor 451 with touch-down potential level, the output terminal OC 1 of the scan signal S1 is still power-source potential VDD level. In addition, output terminals OC2-OCn other than output terminal OC1 are also power-source potential VDD level at this time. In this phase, "H" level and the high current control signal PC change [a driving signal D1] to "H" level in an output circuit 430. With the signal from a control section 434 MOS transistor 435 and the transfer gate 437 of the PURIDORAIBA section 433 Off control, ON control of MOS transistor 436 is carried out, and the gate potential VG 1 of MOS transistor 431 changes to touch-down potential level. Similarly and with the signal from a control section 434 The gate potential VG 2 of MOS transistor 432 changes to touch-down potential level, off control of high current control and MOS transistor 432 is carried out for MOS transistor 431, and a high current IL 1 is supplied from an output terminal OA 1. the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- period discharge of the pulse width of the high current control signal PC -- it carries out. This pulse width is set up so that the potential of an output terminal OA 1 may become low a little from the potential of the forward voltage VF1 of the organic EL device which can emit light by the brightness of a request of an organic EL device at the falling time of a pulse. Therefore, the parasitic capacitance of an organic EL device E1, 1-E1, and n is reverse-charged on the electrical potential difference [a little] higher than the difference of the power-source potential VDD and the potential of forward voltage VF1 at the falling time of this pulse.
[0022] When time of day t2 comes, a blanking signal BL next, in the state of "H" level In an output circuit 430, the high current control signal PC changes to "L" level. With the signal from a control section 434 MOS transistor 435,436 of the PURIDORAIBA section 433 Off control, ON control of the transfer gate 437 is carried out, and the gate potential VG 1 of MOS transistor 431 changes to reference potential Vref level. Similarly and with the signal from a control section 434 While the gate potential VG 2 of MOS transistor 432 has been touch-down potential level, OFF control of constant current control and MOS transistor 432 is carried out for MOS transistor 431, and constant current IF 1 is supplied from an output terminal OA 1. At this time, the parasitic capacitance with which an organic EL device E1, 1-E1, and n were reverse-charged discharges slightly from the time of the high current control signal PC changing to "L" level to blanking period termination, it is at the blanking period termination time, and the potential of an output terminal OA 1 comes to spread the potential of the forward voltage VF1 of an organic EL device, abbreviation, etc. although a blanking period may be set up equally to the pulse width of the high current control signal PC, even if high current control of MOS transistor 431 should be carried out by the delay of a change on "L" level of the high current control signal PC by setting up somewhat longer than this pulse width -- organic EL device E -- a high current does not flow in the forward direction of the diode which constitutes the equal circuit of 1 and 1
[0023] If time of day t3 comes, in an output circuit 430, MOS transistor 431 in next, constant current control and the condition that off control of MOS transistor 432 is carried out In an output circuit 450, a blanking signal BL changes to "L" level. The scan signal S1 changes to power-source potential VDD level. MOS transistor 451 Off control, And ON control of MOS transistor 452 is carried out, and an output terminal OC 1 changes to touch-down potential level. Constant current IF 1 is supplied to 1 and 1. organic EL device [from an output terminal OA

1] E — It discharges from the reverse charge condition that the parasitic capacitance of 1 and 1 is reverse-charged by the difference of the power-source potential VDD and the potential of forward voltage VF1. organic EL device E -- furthermore, it charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF1 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness. organic EL device E -- from the case where the parasitic capacitance of 1 and 1 supplies constant current from the condition reverse-charged with the power-source potential VDD, the starting time amount to luminescence is short, and ends.

[0024] Next, if time of day t4 comes, in the scan phase according to the cathode rays C2 after one at the line sequential by which cathode rays C1 were scanned, in an output circuit 450, "H" level and the scan signal S1 will change to touch-down potential level, as for MOS transistor 451, off control of the blanking signal BL will be carried out, as for ON control and MOS transistor 452, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. In this phase, "L" level and the high current control signal PC change [a driving signal D1] to "H" level in an output circuit 430. With the signal from a control section 434 Off control of ON control, and MOS transistor 436 and the transfer gate 437 is carried out for MOS transistor 435 of the PURIDORAIBA section 433, and the gate potential VG 1 of MOS transistor 431 is set to power-source potential VDD level. Similarly with the signal from a control section 434 The gate potential VG 2 of MOS transistor 432 serves as power-source potential VDD level. ON control of off control and MOS transistor 432 is carried out for MOS transistor 431, and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- reverse voltage VDD supplies 1 and 1 -- having -- organic EL device E -- 1 and 1 stop luminescence. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.

[0025] The pulse width of the above-mentioned high current control signal PC in addition, at the falling time of a pulse When it sets up so that the parasitic capacitance of the organic EL device E1 charged to hard flow, 1-E1, and n may discharge completely and the potential of an output terminal OA 1 may be set to power-source potential VDD level, in the scan phase by cathode rays C1 When an output terminal OC 1 changes to touch-down potential level, the potential of the both ends of an organic EL device E1, 2-E1, and n is power-source potential VDD level. The parasitic capacitance of 1 and 1 is charged in the forward direction. this time -- organic EL device E -- constant current IF 1 supplies 1 and 1 -- having -- this constant current IF 1 -- organic EL device E -- organic EL device E, although the forward voltage VF of the diode characteristics of 1 and 1 tends to turn into the forward voltage VF1 which can emit light by desired brightness The parasitic capacitance of an organic EL device E1, 2-E1, and n is reverse-charged on the electrical potential difference of the difference of power-source potential VDD level and forward voltage VF1 until the potential of an output terminal OA 1 turns into potential of forward voltage VF1. At this time organic EL device E -- 1 and 1 -- this current -- flowing -- organic EL device E -- an one or more constant current [IF] current cannot flow, and 1 and 1 cannot be driven by constant current IF 1. therefore -- above -- a blanking period termination time -- it is -- the potential of an output terminal OA 1 -- the potential of the forward voltage VF1 of an organic EL device, and abbreviation -- if the pulse width of the high current control signal PC is set up so that it may become equal -- organic EL device E -- 1 and 1 can be driven by constant current IF 1, and they can emit light by desired brightness.

[0026] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, each organic EL device of two or more locations of arbitration is operated by driving the anode rays of arbitration for every scan among anode rays A1-Am as if it was emitting light to coincidence.

[0027] Next, based on this invention, the drive approach of the organic electroluminescence display by the driving gear 500 and driving gear 500 of the 2nd example as a driving gear 200 is explained with reference to drawing 4 thru/or drawing 8 . A driving gear 500 has the capacity which indicates the organic EL panel 100 by multi-tone, and it explains it as what is displayed with k (k= 2) ****** =4 gradation of 2 in order to give explanation brief. In drawing 4 , a driving gear 500 consists of an anode plate driver 510 and a cathode driver 520. The anode plate driver 510 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am Based on the high current control signal PC and k= 2-bit driving signal D1[1:0] -Dm[1:0], a high current or touch-down potential is supplied to each output terminals OA1-OAm during the blanking period during a scan. It has m output circuits 530 which supply the constant current or touch-down potential corresponding to gradation throughout [scan term] based on driving signal D1[1:0] -Dm [1:0]. The cathode driver 520 an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 550 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-

Sn. In addition, driving signal D1[1:0] -Dm[1:0] is serially supplied to the anode plate driver 510 from the exterior, is changed into parallel in the circuit which is not illustrated in the anode plate driver 510, and is supplied to an output circuit 530. Moreover, start signal ST and a blanking signal BL are supplied to the cathode driver 520 from the exterior, the level conversion of the scan signals S1-Sn is carried out, and they are supplied to an output circuit 550 while falling and the standup wave-like in a circuit which are not illustrated in the cathode driver 520 are changed into the sequential pulse which started with falling of a blanking signal BL, was alike, and synchronized, respectively. Only the output circuit 530 connected to the output terminal OA 1 shows the circuitry of each output circuit 530 to drawing 5 , only the output circuit 550 connected to the output terminal OC 1 shows the circuitry of each output circuit 550 to drawing 4 , and other output circuits 530,550 are the same circuitry, and are omitting illustration.

[0028] The output circuit 530 connected to the output terminal OA 1 MOS transistor 531 for a P channel mold output to which k= 2-piece parallel connection of the CMOS configuration which supplies a high current, constant current, or touch-down potential was carried out as shown in drawing 5 (0), 531 (1) and MOS transistor 532 for an N channel mold output, MOS transistor 531 (0) and 531 (1), respectively Off control and high current control or the two PURIDORAIBA sections 533 for carrying out constant current control, It has the control section 534 which carries out logic processing of a driving signal D1 [1:0] and the high current control signal PC, carries out the level conversion of the logic signal, and is supplied to the gate and the PURIDORAIBA section 533 of MOS transistor 532. MOS transistor 531 (0) and 531 (1) are controlled based on a driving signal D1 [1:0] to be shown in drawing 6 , in order to supply the constant current IF0 (= 0), IF1, IF2, and IF3 and the high currents IL0 (= 0), IL1, IL2, and IL3 corresponding to 4 gradation from an output terminal OA 1. Namely, off control of MOS transistor 531 (0) and 531 (1) is carried out by driving signal D1 [1:0] = "00" at both the times of constant current IF 0 and a high current IL 0. the time of constant current IF 1 and a high current IL 1 -- driving signal D1 [1:0] = "01" -- MOS transistor 531 (0) -- constant current -- and high current control is carried out and off control of 531 (1) is carried out. MOS transistor 531 (0) carries out off control of the time of constant current IF 2 and a high current IL 2 by driving signal D1 [1:0] = "10" -- having -- 531 (1) -- constant current -- and high current control is carried out. the time of constant current IF 3 and a high current IL 3 -- driving signal D1 [1:0] = "11" -- MOS transistor 531 (0) and 531 (1) -- both -- constant current -- and high current control is carried out. MOS transistor 531 (0) and the current drive capacity of 531 (1) are designed by the magnitude of 1:2 when making it into IF2=2IF1 and IF3=3IF1. In order that the above [MOS transistor 531 (0) and 531 (1)] may control, the PURIDORAIBA section 533 connected to MOS transistor 531 (0) is driven based on the driving signal D1 of a lower bit (0) among driving signals D1 [1:0], and drives the PURIDORAIBA section 533 connected to MOS transistor 531 (1) based on the driving signal D1 of a high order bit (1) among driving signals D1 [1:0]. In order that each PURIDORAIBA section 533 may off-control and high current control MOS transistor 531 (0) and 531 (1), MOS transistor 531 (0), MOS transistor 535 for P channel mold control and MOS transistor 536 for N channel mold control of a CMOS configuration which connect the gate of 531 (1) to the power-source potential VDD and touch-down potential, In order to carry out constant current control of MOS transistor 531 (0) and 531 (1) MOS transistor 531 (0), It has the transfer gate 537 which connects the gate potential VG 1 of 531 (1) to a reference potential Vref, and the signal from a control section 434 is supplied to each gate of MOS transistor 535,536 and the transfer gate 537.

[0029] The output circuit 550 connected to the output terminal OC 1 has P channel mold MOS transistor 551 and N channel mold MOS transistor 552 of a CMOS inverter configuration which supply the power-source potential VDD and touch-down potential based on the scan signal S1, as shown in drawing 4 .

[0030] The drive approach of the organic EL panel 100 by the driving gear 500 is explained. From the exterior, start signal ST and a blanking signal BL are supplied to the cathode driver 520, and the high current control signal PC which has predetermined reversal pulse width narrower than the pulse width of driving signal D1[1:0] - Dm[1:0] and a blanking signal BL of 2 bits in the anode plate driver 510 is supplied. If start signal ST and a blanking signal BL are supplied to the cathode driver 520 from the exterior, from the circuit which is not illustrated in the cathode driver 520, the scan signals S1-Sn with which the standup and falling of pulse shape started with falling of a blanking signal BL, were alike with the signals, and synchronized, respectively will keep the same blanking period as the pulse width of a blanking signal BL in n output circuits 550, and will be supplied to line sequential. this time -- the anode plate driver 510 -- driving signal D1 [1:0] - Dm [driving signal D1[1:0] - Dm[1:0 changed into parallel in the circuit which will not be illustrated in the high current control signal PC and the anode plate driver 510 for every supply of the pulse of each scan signals S1-Sn including a blanking period if 1:0] and the high current control signal PC are supplied] is supplied to m output circuits 530, respectively.

[0031] Hereafter even the phase after being scanned from the phase before cathode rays C1 are scanned in the phase where cathode rays C1 are scanned, about actuation of the output circuit 530 connected to the output terminal OA 1, and the output circuit 550 connected to the output terminal OC 1 Drawing explaining the timing diagram of drawing 7 and the control state of each component of drawing 8 is used together and explained, assuming that it is what anode rays A1 drove by constant current IF 2, and anode rays A1 did not drive in the

phase of order.
[0032] First, it is a scan phase (this side of time of day t1) by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 550, a blanking signal BL is "L" level, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 551 is [off control of ON control and MOS transistor 552 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. In this phase, it sets to an output circuit 530. Driving signal D1 [1:0] = "00", A driving signal D1 (0) and D1 (1) are ["L" level and the high current control signal PC] "L" level. Namely, with the signal from a control section 534 Off control of ON control, and MOS transistor 536 and the transfer gate 537 is carried out for MOS transistor 535 of each PURIDORAIBA section 533. MOS transistor 531 (0), The gate potentials [VG / VG (0) and / 1] 1 (1) of 531 (1) on power-source potential VDD level Similarly, the gate potential VG 2 of MOS transistor 532 is power-source potential VDD level, ON control of off control and MOS transistor 532 is carried out for MOS transistor 531 (0) and 531 (1) by the signal from a control section 534, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.
[0033] Next, when time of day t1 comes, in an output circuit 550, a blanking signal BL changes to "H (yes)" level, and while off control of ON control and MOS transistor 552 was carried out for MOS transistor 551 with touch-down potential level, the output terminal OC 1 of the scan signal S1 is still power-source potential VDD level. In addition, output terminals OC2-OCn other than output terminal OC1 are also power-source potential VDD level at this time. While driving signal D1 [1:0] = "10" (0) D1, i.e., a driving signal, has been "L" level in an output circuit 530 in this phase Driving signal D1 (1) "H" level and the high current control signal PC change to "H" level. With the signal from a control section 534 MOS transistor 531 (1) Near MOS transistor 535 and the near transfer gate 537 of the PURIDORAIBA section 533 Off control, ON control of MOS transistor 536 is carried out, and the gate potential VG 1 (1) of MOS transistor 531 (1) changes to touch-down potential level. Similarly and with the signal from a control section 534 The gate potential VG 2 of MOS transistor 532 changes to touch-down potential level, and while the gate potential VG 1 (0) of MOS transistor 531 (0) has been power-source potential VDD level For high current control and MOS transistor 532, OFF control is carried out and MOS transistor 531 (1) is MOS transistor 531 (0). While it has been OFF control A high current IL 2 is supplied from an output terminal OA 1 through MOS transistor 531 (1) MOS transistor 531 (0) and among 531 (1). the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- the high current control signal PC -- period discharge of the period of "H" level, i.e., the pulse width of the high current control signal PC, -- it carries out. This pulse width is set up so that it may become low a little from the potential of the forward voltage VF2 of the organic EL device when driving by the constant current IF 2 to which the potential of an output terminal OA 1 can emit light by the brightness of a request of an organic EL device at the falling time of a pulse. Therefore, the parasitic capacitance of an organic EL device E1, 1-E1, and n is reverse-charged on the electrical potential difference [a little] higher than the difference of the power-source potential VDD and the potential of forward voltage VF2 at the falling time of this pulse.
[0034] When time of day t2 comes, a blanking signal BL next, in the state of "H" level In an output circuit 530, the high current control signal PC changes to "L" level. With the signal from a control section 534 MOS transistor 531 (1) While off control of MOS transistor 535,536 of the near PURIDORAIBA section 533 is carried out, ON control of the transfer gate 537 is carried out. The gate potential VG 1 (1) of MOS transistor 531 (1) changes to reference potential Vref level. While power-source potential VDD level and the gate potential VG 2 of MOS transistor 532 have been touch-down potential level, the gate potential VG 1 (0) of MOS transistor 531 (0) Constant current control of MOS transistor 531 (1) is carried out, and while MOS transistor 531 (0) and 532 have been OFF control, constant current IF 2 is supplied from an output terminal OA 1. At this time, the parasitic capacitance with which an organic EL device E1, 1-E1, and n were reverse-charged discharges slightly from the time of the high current control signal PC changing to "H" level to blanking period termination, it is at the blanking period termination time, and the potential of an output terminal OA 1 comes to spread the potential of the forward voltage VF2 of an organic EL device, abbreviation, etc. although a blanking period may be set up equally to the pulse width of the high current control signal PC, even if high current control of MOS transistor 531 (0) and 531 (1) should be carried out by the delay of a change on "L" level of the high current control signal PC by setting up somewhat longer than this pulse width -- organic EL device E -- a high current does not flow in the forward direction of the diode which constitutes the equal circuit of 1 and 1
[0035] If time of day t3 comes, in an output circuit 530, MOS transistor 531 (1) in next, constant current control and MOS transistor 531 (0), and the condition that off control of 532 is carried out In an output circuit 550, a blanking signal BL changes to "L" level. The scan signal S1 changes to power-source potential VDD level. MOS transistor 551 Off control, And ON control of MOS transistor 552 is carried out, and an output terminal OC 1

changes to touch-down potential level. Constant current IF 2 is supplied to 1 and 1. organic EL device [from an output terminal OA 1] E -- It discharges from the reverse charge condition that the parasitic capacitance of 1 and 1 is reverse-charged by the difference of the power-source potential VDD and the potential of forward voltage VF2. organic EL device E -- furthermore, it charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF2 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness. organic EL device E -- from the case where the parasitic capacitance of 1 and 1 supplies constant current from the condition reverse-charged with the power-source potential VDD, the starting time amount to luminescence is short, and ends.

[0036] Next, if time of day t4 comes, in the scan phase according to the cathode rays C2 after one at the line sequential by which cathode rays C1 were scanned, in an output circuit 550, "H" level and the scan signal S1 will change to touch-down potential level, as for MOS transistor 551, off control of the blanking signal BL will be carried out, as for ON control and MOS transistor 552, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. In this phase, it sets to an output circuit 530. Driving signal D1 [1:0] = "00", "L" level and the high current control signal PC change [a driving signal D1 (0) and D1 (1)] to "H" level. Namely, with the signal from a control section 534 Off control of ON control, and MOS transistor 536 and the transfer gate 537 is carried out for MOS transistor 535 of each PURIDORAIBA section 533. MOS transistor 531 (0), The gate potentials [VG / VG (0) and / 1] 1 (1) of 531 (1) are set to power-source potential VDD level. Similarly with the signal from a control section 534 The gate potential VG 2 of MOS transistor 532 is set to power-source potential VDD level. ON control of off control and MOS transistor 532 is carried out for MOS transistor 531 (0) and 531 (1), and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- reverse voltage VDD supplies 1 and 1 -- having -- organic EL device E -- 1 and 1 stop luminescence. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.

[0037] The pulse width of the above-mentioned high current control signal PC in addition, at the falling time of a pulse When it sets up so that the parasitic capacitance of the organic EL device E1 charged to hard flow, 1-E1, and n may discharge completely and the potential of an output terminal OA 1 may be set to power-source potential VDD level, in the scan phase by cathode rays C1 When an output terminal OC 1 changes to touch-down potential level, the potential of the both ends of an organic EL device E1, 2-E1, and n is power-source potential VDD level. The parasitic capacitance of 1 and 1 is charged in the forward direction. this time -- organic EL device E -- constant current IF 2 supplies 1 and 1 -- having -- this constant current IF 2 -- organic EL device E -- organic EL device E, although the forward voltage VF of the diode characteristics of 1 and 1 tends to turn into the forward voltage VF2 which can emit light by desired brightness The parasitic capacitance of an organic EL device E1, 2-E1, and n is reverse-charged on the electrical potential difference of the difference of power-source potential VDD level and forward voltage VF2 until the potential of an output terminal OA 1 turns into potential of forward voltage VF2. At this time organic EL device E -- 1 and 1 -- this current -- flowing -- organic EL device E -- a two or more constant current [IF] current cannot flow, and 1 and 1 cannot be driven by constant current IF 2. therefore -- above -- a blanking period termination time -- it is -- the potential of an output terminal OA 1 -- the potential of the forward voltage VF2 of an organic EL device, and abbreviation -- if the pulse width of the high current control signal PC is set up so that it may become equal -- organic EL device E -- 1 and 1 can be driven by constant current IF 2, and they can emit light by desired brightness.

[0038] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, by driving the anode rays of arbitration based on 2-bit driving signal D1[1:0] -Dm[1:0] for every scan among anode rays A1-Am Each organic EL device of two or more locations of arbitration is operated as if it was emitting light to coincidence.

[0039] In the 1st and 2nd examples of the above, in addition, the initiation time of the drive by the high current Although the case of being the same as that of the initiation time of each blanking period was explained at the last scan period to the anode rays which were not driven by constant current among the anode rays driven by constant current at the scan period immediately after each blanking period When a high current drive is similarly carried out to the anode rays driven by constant current at the last scan period, the potential of the anode rays driven by constant current at the last scan period By being at the initiation time of a blanking period, being the potential when driving by constant current at the last scan period, and carrying out a high current drive further Until the potential of these anode rays turns into potential when driving by constant current from power-source potential, when it becomes power-source potential and drives by constant current at the scan period immediately after a blanking period From the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays The influx of the current to

the organic EL device connected to the cathode rays scanned can arise, the current beyond constant current can flow to an organic EL device, and an organic EL device cannot be made to emit light by desired brightness. In order to solve this fault, you may make it drive the drive by the high current by the drive period in this high current, and constant current to a deed and the anode rays which drove by constant current at the last scan period only to the anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period. As opposed to the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period when doing in this way Since it does not drive by the high current but drives by constant current, it is at the termination time of a blanking period. When it is only going up slightly and the potential of these anode rays is driven by constant current at the scan period immediately after a blanking period, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

[0040] Moreover, the initiation time of the drive by the high current is not made the same as that of the initiation time of each blanking period, but once it is at the initiation time of each blanking period and makes into touch-down potential potential of the anode rays driven by constant current at the scan period immediately after each blanking period, the drive by the high current may be started. If it does in this way, it will be the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.

[0041]

[Effect of the Invention] According to the drive approach of an organic electroluminescence display and driving gear concerning this invention The anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends. Moreover, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

[Translation done.]

TECHNICAL FIELD

[Field of the Invention] This invention relates to the drive approach of the organic electroluminescence (electroluminescence) display of a passive matrix, and a driving gear.

[Translation done.]

* NOTICES *

PRIOR ART

[Description of the Prior Art] The organic electroluminescence display of a passive matrix consists of an organic EL panel 100 and a driving gear 200 which drives this organic EL panel 100, as shown in drawing 9 . An organic EL panel 100 is the structure in which the matrix-like pixel was formed, as the organic EL device E1 whose organic thin film is pinched on a glass substrate by cathode-rays C1 -Cn which consists of anode-rays A1 -Am which consists of a transparent electrode, and a metal electrode and by which an equal circuit is expressed with diode and the parasitic capacitance by which parallel connection was carried out to this in the intersection of a two-electrodes line, 1 -Em, and n. The driving gear 200 consists of an anode plate driver 210 by which electrical installation is carried out to anode-rays A1 -Am, and a cathode driver 220 by which electrical installation is carried out to cathode-rays C1 -Cn. While scanning cathode-rays C1 -Cn to line sequential with a fixed time interval by the cathode driver 220, it is made to make the organic EL devices Ei and j of the intersection location of arbitration emit light by driving anode-rays A1 -Am by the anode plate driver 210 at this scan period.
[0003] Next, the conventional driving gear 300 as a driving gear 200 is explained with reference to drawing 10 and drawing 11 . In drawing 10 , a driving gear 300 consists of an anode plate driver 310 and a cathode driver 320. The anode plate driver 310 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am It has m output circuits 330 which supply the constant current IF 1 which can make each output terminals OA1-OAm emit light based on driving signals D1-Dm by the brightness of a request of an organic EL device E1, 1-Em, and n, or the touch-down potential which carries out a luminescence halt. the cathode driver 320 -- an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 350 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-Sn. In addition, driving signals D1-Dm are serially supplied to the anode plate driver 310 from the exterior, and the level conversion of them is carried out and they are supplied to an output circuit 330 while being changed into parallel in the circuit which is not illustrated in the anode plate driver 310. Moreover, start signal ST is supplied to the cathode driver 320 from the exterior, the level conversion of them is carried out and the scan signals S1-Sn are supplied to an output circuit 350 while they are changed into a pulse sequential in the circuit which is not illustrated in the cathode driver 320. Only the output circuit 330 where each output circuit 330,350 was connected to the output terminal OA 1, and the output circuit 350 connected to the output terminal OC 1 illustrate circuitry, and other output circuits 330,350 are the same circuitry, and are omitting illustration.
[0004] The output circuit 330 connected to the output terminal OA 1 MOS transistor 331 for a P channel mold output and MOS transistor 332 for an N channel mold output of a CMOS configuration which supply constant current IF 1 and touch-down potential, MOS transistor 333 for P channel mold control which connects the gate of MOS transistor 331 to the power-source potential VDD in order to carry out off control of MOS transistor 331, The transfer gate 334 which connects the gate potential VG 1 of MOS transistor 331 to a reference potential Vref in order to carry out constant current control of MOS transistor 331, It has the inverter 335 which is made to reverse a driving signal D1 and is supplied to the gate of MOS transistor 332, and the gate by the side of the P channel of the transfer gate 334. A driving signal D1 is directly supplied to the gate of MOS transistor 333, and the gate by the side of the N channel of the transfer gate 334.
[0005] The output circuit 350 connected to the output terminal OC 1 has MOS transistor 351 for a P channel mold output of a CMOS inverter configuration and MOS transistor 352 for an N channel mold output which supply the power-source potential VDD and touch-down potential, and the scan signal S1 is directly supplied to these gates.
[0006] The drive approach of the organic EL panel 100 by the driving gear 300 is explained. From the exterior, driving signals D1-Dm are supplied to the anode plate driver 310, and start signal ST is supplied to the cathode driver 320. If start signal ST is supplied to the cathode driver 320 from the exterior, the scan signals S1-Sn will be supplied to n output circuits 350 line sequential from the circuit which is not illustrated in the cathode driver 320. If driving signals D1-Dm are supplied to the anode plate driver 310 at this time, the driving signals D1-Dm changed into parallel in the circuit which is not illustrated in the anode plate driver 310 will be supplied to m

output circuits 330, respectively for every supply of the pulse of each scan signals S1-Sn.
[0007] Hereafter, drawing 11 is used together and explained about actuation of the output circuit 330 connected to the output terminal OA 1, and the output circuit 350 connected to the output terminal OC 1, assuming even the phase after being scanned from the phase before cathode rays C1 are scanned to be what anode rays A1 did not drive in the phase of order.
[0008] First, it is a scan phase by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 350, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 351 is [off control of ON control and MOS transistor 352 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. A driving signal D1 is touch-down potential level, in this phase, in an output circuit 330, while ON control of MOS transistor 333 is carried out, off control of the transfer gate 334 is carried out, the gate potential VG 1 of MOS transistor 331 is [power-source potential VDD level and the gate potential VG 2 of MOS transistor 332] power-source potential VDD level, ON control of off control and MOS transistor 332 is carried out for MOS transistor 331, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.
[0009] Next, if the scan signal S1 currently supplied to the output circuit 350 changes to power-source potential VDD level, while off control of MOS transistor 351 is carried out, ON control of MOS transistor 352 will be carried out, and an output terminal OC 1 will change to touch-down potential level. In addition, output terminals OC2-OCn other than output terminal OC1 are power-source potential VDD level at this time. It synchronizes with changing, and if this driving signal D1 currently supplied to the output circuit 330 changes to power-source potential VDD level, while ON control of off control and the transfer gate 334 will be carried out for MOS transistor 333 and the gate potential VG 1 of MOS transistor 331 will change to reference potential Vref level, the gate potential VG 2 of MOS transistor 332 changes to touch-down potential level, off control of constant current control and MOS transistor 332 is carried out for MOS transistor 331, and constant current IF 1 is supplied from an output terminal OA 1. the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- discharging -- further -- organic EL device E -- the parasitic capacitance of 1 and 1 charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF1 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness.
[0010] Next, if the scan signal S1 currently supplied to the output circuit 350 in the scan phase by the cathode rays C2 after one changes to touch-down potential level by the line sequential by which cathode rays C1 were scanned, while ON control of MOS transistor 351 is carried out, off control of MOS transistor 352 will be carried out, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. If this driving signal D1 that synchronizes with changing and is supplied to the output circuit 330 changes to touch-down potential level While off control of ON control and the transfer gate 334 is carried out for MOS transistor 333 and the gate potential VG 1 of MOS transistor 331 changes to power-source potential VDD level the gate potential VG 2 of MOS transistor 332 changes to power-source potential VDD level, ON control of off control and MOS transistor 332 is carried out for MOS transistor 331, and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- luminescence of 1 and 1 is stopped. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.
[0011] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, each organic EL device of two or more locations of arbitration is operated by driving the anode rays of arbitration for every scan among anode rays A1-Am as if it was emitting light to coincidence.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to the drive approach of an organic electroluminescence display and driving gear concerning this invention The anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends. Moreover, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, the above-mentioned driving gear 300 is a scan phase by another cathode rays in front of one in the line sequential by which a certain cathode rays are scanned as mentioned above, and the parasitic capacitance of the organic EL device connected to cathode rays other than the cathode rays scanned among the organic EL devices connected to the anode rays which are not driven in this phase is charged to hard flow. When making the organic EL device which scanned a certain cathode rays and was connected to the front anode rays which were not being driven in a phase and these cathode rays in the next phase emit light, For example, if it drives by constant current IF 1 as the current from an output terminal OA 1 is shown in drawing 11 The parasitic capacitance of the organic EL device charged to the hard flow connected to the cathode rays which were not scanned in the front phase among the organic EL devices connected to these anode rays discharges by this constant current IF 1. Since the parasitic capacitance of the organic EL device furthermore scanned among these organic EL devices is charged by this constant current IF 1 in the forward direction, As the potential of an output terminal OA 1 is shown in drawing 11 , the potential of the output terminal of the driving gear 300 connected to anode rays Since starting even to the potential of the forward voltage VF1 of the diode characteristics of the organic EL device scanned took time amount and luminescence time amount became short, there was a problem that the brightness of organic EL panel 100 original was not obtained.
[0013] Therefore, it was made in order that this invention might solve the above-mentioned trouble, and it aims at offering the driving gear of the organic electroluminescence display which shortened time amount to luminescence in a scan period by discharging quickly the parasitic capacitance with which the organic EL device by which the high current was connected to the anode rays driven by the next scan at the blanking period between scans at the anode rays of a predetermined time sink lever was reverse-charged.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] (1) The drive approach of the organic electroluminescence display concerning this invention Make the cathode rays of an organic EL panel line sequential from power-source potential by the cathode driver at touch-down potential, scan, and the anode rays of the arbitration of an organic EL panel are driven by constant current by the anode plate driver at each line sequential scan period. In the drive approach of the organic electroluminescence display of a simple matrix drive method of making the organic EL device of the arbitration contained in an organic EL panel emitting light by desired brightness A blanking period is established between said each scan period, and it is characterized by driving the anode rays driven by constant current at the scan period immediately after each of this blanking period by the larger high current than said constant current at said each blanking period. According to the above-mentioned means, the anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends.
(2) The drive approach of the organic electroluminescence indicating equipment concerning this invention is characterized by the thing by which it is the potential of the anode rays driven by constant current at the scan period immediately after said each blanking period at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request and which is driven by said high current so that it may become in the above-mentioned (1) term. According to the above-mentioned means, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.
(3) The drive approach of the organic electroluminescence display concerning this invention is characterized by the change time to the drive of constant current from said high current being a front [time / of each of said blanking period / termination] in the above-mentioned (1) term or (2) terms. According to the above-mentioned means, even if the change to the drive of constant current from a high current is overdue, by the time the cathode-rays side of the organic EL device connected to the cathode rays scanned becomes touch-down potential, the drive of a high current will be ended, and an organic EL device should not drive by the high current.

(4) It is characterized by the initiation time of the drive by said high current of the drive approach of the organic electroluminescence display concerning this invention being the same as the initiation time of each of said blanking period in one of the above-mentioned (1) term thru/or (3) terms.
(5) The drive approach of the organic electroluminescence display concerning this invention In one of the above-mentioned (1) term thru/or (4) terms the drive by said high current The anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after said each blanking period are received, and it is a chisel. It is characterized by driving by the drive period in said high current, and said constant current at the last scan period to the anode rays driven by constant current. As opposed to the anode rays which were driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period according to the above-mentioned means Since it does not drive by the high current but drives by constant current, it is at the termination time of a blanking period. When it drives according to constant current at the

scan period immediately after a blanking period still in the state when driving the potential of these anode rays by constant current, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(6) The drive approach of the organic electroluminescence display concerning this invention is characterized by starting it, once it is the drive by said high current at the initiation time of each of said blanking period and it makes potential of the anode rays driven by constant current at the scan period immediately after said each blanking period touch-down potential in one of the above-mentioned (1) term thru/or (3) terms. According to the above-mentioned means, it is the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.

(7) The driving gear of the organic electroluminescence display concerning this invention The cathode driver which scans from power-source potential by carrying out the cathode rays of an organic EL panel to touch-down potential line sequential, In the driving gear of the organic electroluminescence indicating equipment of the simple matrix drive method which makes the organic EL device of the arbitration which possesses the anode plate driver which drives the anode rays of the arbitration of an organic EL panel by constant current at each said line sequential scan period, and is contained in an organic EL panel emit light by desired brightness said cathode driver While establishing and scanning a blanking period between said each scan period, said anode plate driver is characterized by driving the anode rays driven by constant current at the scan period immediately after said each blanking period by the larger high current than said constant current at said each blanking period. According to the above-mentioned means, the anode rays driven by constant current at the scan period immediately after each blanking period by driving by the high current at each blanking period When the parasitic capacitance with which the organic EL device connected to these anode rays was reverse-charged can be made to discharge quickly, without changing actuation of a cathode driver and it drives by constant current at the scan period immediately after each blanking period, Time amount until it drives with the forward voltage to which an organic EL device can emit light by desired brightness is short, and ends.

(8) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by said anode plate driver having high current control and the PURIDORAIBA section which carries out constant current control for the transistor for an output which supplies said high current and constant current, and this output transistor in the above-mentioned (7) term. According to the above-mentioned means, both drives of a high current and constant current can be performed only by changing the potential of the control terminal of the transistor for an output.

(9) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by the thing by which it is the potential of the anode rays which said anode plate driver drives by constant current at each [said] scan period after direct at the termination time of each of said blanking period, and it spreads abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by the brightness of said request and which is driven by said high current so that it may become in the above-mentioned (7) term or (8) terms. According to the above-mentioned means, the parasitic capacitance with which the organic EL device connected to the anode rays driven by constant current at the scan period immediately after a blanking period was reverse-charged Since it is made to discharge until it comes to spread abbreviation etc. on the potential of the forward voltage of the organic EL device when emitting light by desired brightness When it drives by constant current at the scan period immediately after each blanking period, from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to the anode rays to drive There is no influx of the current to the organic EL device connected to the cathode rays scanned, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(10) It is characterized by said anode plate driver changing the driving gear of the organic electroluminescence display concerning this invention from said high current to the drive of constant current before the termination time of each of said blanking period in one of the above-mentioned (7) term thru/or (9) terms. According to the above-mentioned means, even if the change to the drive of constant current from a high current is overdue, by the time the cathode-rays side of the organic EL device connected to the cathode rays scanned becomes touch-down potential, the drive of a high current will be ended, and an organic EL device should not drive by the high current.

(11) The driving gear of the organic electroluminescence display concerning this invention is characterized by

said anode plate driver starting the drive by said high current to initiation and coincidence of each of said blanking period in one of the above-mentioned (7) term thru/or (10) terms.

(12) The driving gear of the organic electroluminescence display concerning this invention In one of the above-mentioned (7) term thru/or (11) terms said anode plate driver It drives by said high current at the last scan period only to the anode rays which were not driven by constant current among the anode rays driven by constant current at each [said] scan period after direct. It is characterized by driving by the drive period in said high current, and said constant current at the last scan period to the anode rays driven by constant current. As opposed to the anode rays which were driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period according to the above-mentioned means Since it does not drive by the high current but drives by constant current, it is at the termination time of a blanking period. When it drives according to constant current at the scan period immediately after a blanking period still in the state when driving the potential of these anode rays by constant current, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

(13) In one of the above-mentioned (7) term thru/or (10) terms, once it is the driving gear of the organic electroluminescence display concerning this invention at the initiation time of each of said blanking period and it makes potential of the anode rays which said anode plate driver drives by constant current at each [said] scan period after direct touch-down potential, it is characterized by starting the drive by said high current. According to the above-mentioned means, it is the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.

(14) The driving gear of the organic electroluminescence display concerning this invention The driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside in one of the above-mentioned (7) term thru/or (13) terms, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential, The MOS transistor for a P channel mold output which a CMOS configuration is carried out by this MOS transistor for an N channel mold output, and supplies said high current and constant current, It is characterized by having the PURIDORAIBA section which controls the gate of said MOS transistor for a P channel mold output, and the control section which controls the gate and said PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal.

(15) The driving gear of the organic electroluminescence indicating equipment concerning this invention is characterized by said PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential in the above-mentioned (7) term.

(16) In one of the above-mentioned (7) term thru/or (13) terms, as for the driving gear of the organic electroluminescence display concerning this invention, said anode plate driver is characterized by driving by the constant current corresponding to the k-th power gradation display of 2, in order that 2 may indicate said organic EL panel by gradation the k-th power.

(17) The driving gear of the organic electroluminescence display concerning this invention The k-bit driving signal by which serial/parallel conversion was carried out since said anode plate driver was supplied from the outside and corresponded to said each anode rays inside in the above-mentioned (16) term, It has the output circuit which performs said each drive based on the high current control signal which is supplied from the outside and has the pulse width within said blanking period for every anode rays. The MOS transistor for an N channel mold output to which said each output circuit supplies touch-down potential with a CMOS configuration, and the MOS transistor for a P channel mold output of the k piece juxtaposition which supplies said high current and constant current, The k PURIDORAIBA sections which control the gate of said MOS transistor for a P channel each mold output, It is characterized by having the control section which controls the gate and said each PURIDORAIBA section of said MOS transistor for an N channel mold output based on said driving signal and a high current control signal.

(18) The driving gear of the organic electroluminescence indicating equipment concerning this invention is

characterized by said each PURIDORAIBA section having the MOS transistor for N channel mold control which supplies touch-down potential, the MOS transistor for P channel mold control which supplies power-source potential, and the transfer gate which supplies constant-current-control potential in the above-mentioned (17) term.

[0015]

[Embodiment of the Invention] Below, based on this invention, the drive approach of the organic electroluminescence display by the driving gear 400 and driving gear 400 of the 1st example as a driving gear 200 is explained with reference to drawing 1 thru/or drawing 3 . In drawing 1 , a driving gear 400 consists of an anode plate driver 410 and a cathode driver 420. The anode plate driver 410 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am Based on the high current control signal PC and driving signals D1-Dm, a high current or touch-down potential is supplied to each output terminals OA1-OAm during the blanking period during a scan. It has m output circuits 430 which supply constant current or touch-down potential throughout [scan term] based on driving signals D1-Dm. The cathode driver 420 an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 450 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-Sn. In addition, driving signals D1-Dm are serially supplied to the anode plate driver 410 from the exterior, are changed into parallel in the circuit which is not illustrated in the anode plate driver 410, and are supplied to an output circuit 430. Moreover, start signal ST and a blanking signal BL are supplied to the cathode driver 420 from the exterior, the level conversion of the scan signals S1-Sn is carried out, and they are supplied to an output circuit 450 while falling and the standup wave-like in a circuit which are not illustrated in the cathode driver 420 are changed into the sequential pulse which started with falling of a blanking signal BL, was alike, and synchronized, respectively. Only the output circuit 430 where each output circuit 430,450 was connected to the output terminal OA 1, and the output circuit 450 connected to the output terminal OC 1 illustrate circuitry, and other output circuits 430,450 are the same circuitry, and are omitting illustration.

[0016] The output circuit 430 connected to the output terminal OA 1 has MOS transistor 431 for a P channel mold output of a CMOS configuration and MOS transistor 432 for an N channel mold output which supply a high current or constant current, and touch-down potential, and the control section 434 which carries out logic processing of off control and high current control or the PURIDORAIBA section 433 for carrying out constant current control, and a driving signal D1 and the high-current control signal PC for MOS transistor 431, carries out the level conversion of the logic signal, and is supplied to the gate and the PURIDORAIBA section 433 of MOS transistor 432. The PURIDORAIBA section 433 MOS transistor 435 for P channel mold control and MOS transistor 436 for N channel mold control of a CMOS configuration which connect the gate of MOS transistor 431 to the power-source potential VDD or touch-down potential in order to off-control or high current control MOS transistor 431, It has the transfer gate 437 which connects the gate potential VG 1 of MOS transistor 431 to a reference potential Vref in order to carry out constant current control of MOS transistor 431. The signal from a control section 434 is supplied to each gate of MOS transistor 435,436 and the transfer gate 437.

[0017] The output circuit 450 connected to the output terminal OC 1 has P channel mold MOS transistor 451 and N channel mold MOS transistor 452 of a CMOS inverter configuration which supply the power-source potential VDD and touch-down potential based on the scan signal S1.

[0018] The drive approach of the organic EL panel 100 by the driving gear 400 is explained. From the exterior, start signal ST and a blanking signal BL are supplied to the cathode driver 420, and the high current control signal PC which has predetermined pulse width narrower than the pulse width of driving signals D1-Dm and a blanking signal BL in the anode plate driver 410 is supplied. If start signal ST and a blanking signal BL are supplied to the cathode driver 420 from the exterior, from the circuit which is not illustrated in the cathode driver 420, the scan signals S1-Sn with which the standup and falling of pulse shape started with falling of a blanking signal BL, were alike with the signals, and synchronized, respectively will keep the same blanking period as the pulse width of a blanking signal BL in n output circuits 450, and will be supplied to line sequential. If driving signals D1-Dm and the high current control signal PC are supplied to the anode plate driver 410 at this time, the high current control signal PC and the driving signals D1-Dm changed into parallel in the circuit which is not illustrated in the anode plate driver 410 will be supplied to m output circuits 430, respectively for every supply of the pulse of each scan signals S1-Sn including a blanking period.

[0019] Drawing explaining the timing diagram of drawing 2 and the control state of each component of drawing 3 is used together and explained about actuation of the output circuit 430 hereafter connected to the output terminal OA 1, and the output circuit 450 connected to the output terminal OC 1, assuming even the phase after being scanned from the phase before cathode rays C1 are scanned to be what anode rays A1 did not drive in the phase of order.

[0020] First, it is a scan phase (this side of time of day t1) by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 450, a blanking signal BL is "L (low)

level, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 451 is [off control of ON control and MOS transistor 452 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. In this phase, a driving signal D1 is ["L" level and the high current control signal PC] "L" level in an output circuit 430. With the signal from a control section 434 Off control of ON control, and MOS transistor 436 and the transfer gate 437 is carried out for MOS transistor 435 of the PURIDORAIBA section 433. The gate potential VG 1 of MOS transistor 431 on power-source potential VDD level Similarly, the gate potential VG 2 of MOS transistor 432 is power-source potential VDD level, ON control of off control and MOS transistor 432 is carried out for MOS transistor 431 by the signal from a control section 434, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.

[0021] Next, when time of day t1 comes, in an output circuit 450, a blanking signal BL changes to "H (yes)" level, and while off control of ON control and MOS transistor 452 was carried out for MOS transistor 451 with touch-down potential level, the output terminal OC 1 of the scan signal S1 is still power-source potential VDD level. In addition, output terminals OC2-OCn other than output terminal OC1 are also power-source potential VDD level at this time. In this phase, "H" level and the high current control signal PC change [a driving signal D1] to "H" level in an output circuit 430. With the signal from a control section 434 MOS transistor 435 and the transfer gate 437 of the PURIDORAIBA section 433 Off control, ON control of MOS transistor 436 is carried out, and the gate potential VG 1 of MOS transistor 431 changes to touch-down potential level. Similarly and with the signal from a control section 434 The gate potential VG 2 of MOS transistor 432 changes to touch-down potential level, off control of high current control and MOS transistor 432 is carried out for MOS transistor 431, and a high current IL 1 is supplied from an output terminal OA 1. the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- period discharge of the pulse width of the high current control signal PC -- it carries out. This pulse width is set up so that the potential of an output terminal OA 1 may become low a little from the potential of the forward voltage VF1 of the organic EL device which can emit light by the brightness of a request of an organic EL device at the falling time of a pulse. Therefore, the parasitic capacitance of an organic EL device E1, 1-E1, and n is reverse-charged on the electrical potential difference [a little] higher than the difference of the power-source potential VDD and the potential of forward voltage VF1 at the falling time of this pulse.

[0022] When time of day t2 comes, a blanking signal BL next, in the state of "H" level In an output circuit 430, the high current control signal PC changes to "L" level. With the signal from a control section 434 MOS transistor 435,436 of the PURIDORAIBA section 433 Off control, ON control of the transfer gate 437 is carried out, and the gate potential VG 1 of MOS transistor 431 changes to reference potential Vref level. Similarly and with the signal from a control section 434 While the gate potential VG 2 of MOS transistor 432 has been touch-down potential level, OFF control of constant current control and MOS transistor 432 is carried out for MOS transistor 431, and constant current IF 1 is supplied from an output terminal OA 1. At this time, the parasitic capacitance with which an organic EL device E1, 1-E1, and n were reverse-charged discharges slightly from the time of the high current control signal PC changing to "L" level to blanking period termination, it is at the blanking period termination time, and the potential of an output terminal OA 1 comes to spread the potential of the forward voltage VF1 of an organic EL device, abbreviation, etc. although a blanking period may be set up equally to the pulse width of the high current control signal PC, even if high current control of MOS transistor 431 should be carried out by the delay of a change on "L" level of the high current control signal PC by setting up somewhat longer than this pulse width -- organic EL device E -- a high current does not flow in the forward direction of the diode which constitutes the equal circuit of 1 and 1

[0023] If time of day t3 comes, in an output circuit 430, MOS transistor 431 in next, constant current control and the condition that off control of MOS transistor 432 is carried out In an output circuit 450, a blanking signal BL changes to "L" level. The scan signal S1 changes to power-source potential VDD level. MOS transistor 451 Off control, And ON control of MOS transistor 452 is carried out, and an output terminal OC 1 changes to touch-down potential level. Constant current IF 1 is supplied to 1 and 1. organic EL device [from an output terminal OA 1] E -- It discharges from the reverse charge condition that the parasitic capacitance of 1 and 1 is reverse-charged by the difference of the power-source potential VDD and the potential of forward voltage VF1. organic EL device E -- furthermore, it charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF1 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness. organic EL device E -- from the case where the parasitic capacitance of 1 and 1 supplies constant current from the condition reverse-charged with the power-source potential VDD, the starting time amount to luminescence is short, and ends.

[0024] Next, if time of day t4 comes, in the scan phase according to the cathode rays C2 after one at the line sequential by which cathode rays C1 were scanned, in an output circuit 450, "H" level and the scan signal S1 will change to touch-down potential level, as for MOS transistor 451, off control of the blanking signal BL will be carried out, as for ON control and MOS transistor 452, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. In this phase, "L" level and the high current control signal PC change [a driving signal D1] to "H" level in an output circuit 430. With the signal from a control section 434 Off control of ON control, and MOS transistor 436 and the transfer gate 437 is carried out for MOS transistor 435 of the PURIDORAIBA section 433, and the gate potential VG 1 of MOS transistor 431 is set to power-source potential VDD level. Similarly with the signal from a control section 434 The gate potential VG 2 of MOS transistor 432 serves as power-source potential VDD level. ON control of off control and MOS transistor 432 is carried out for MOS transistor 431, and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- reverse voltage VDD supplies 1 and 1 -- having -- organic EL device E -- 1 and 1 stop luminescence. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.

[0025] The pulse width of the above-mentioned high current control signal PC in addition, at the falling time of a pulse When it sets up so that the parasitic capacitance of the organic EL device E1 charged to hard flow, 1-E1, and n may discharge completely and the potential of an output terminal OA 1 may be set to power-source potential VDD level, in the scan phase by cathode rays C1 When an output terminal OC 1 changes to touch-down potential level, the potential of the both ends of an organic EL device E1, 2-E1, and n is power-source potential VDD level. The parasitic capacitance of 1 and 1 is charged in the forward direction. this time -- organic EL device E -- constant current IF 1 supplies 1 and 1 -- having -- this constant current IF 1 -- organic EL device E -- organic EL device E, although the forward voltage VF of the diode characteristics of 1 and 1 tends to turn into the forward voltage VF1 which can emit light by desired brightness The parasitic capacitance of an organic EL device E1, 2-E1, and n is reverse-charged on the electrical potential difference of the difference of power-source potential VDD level and forward voltage VF1 until the potential of an output terminal OA 1 turns into potential of forward voltage VF1. At this time organic EL device E -- 1 and 1 -- this current -- flowing -- organic EL device E -- an one or more constant current [IF] current cannot flow, and 1 and 1 cannot be driven by constant current IF 1. therefore -- above -- a blanking period termination time -- it is -- the potential of an output terminal OA 1 -- the potential of the forward voltage VF1 of an organic EL device, and abbreviation -- if the pulse width of the high current control signal PC is set up so that it may become equal -- organic EL device E -- 1 and 1 can be driven by constant current IF 1, and they can emit light by desired brightness.

[0026] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, each organic EL device of two or more locations of arbitration is operated by driving the anode rays of arbitration for every scan among anode rays A1-Am as if it was emitting light to coincidence.

[0027] Next, based on this invention, the drive approach of the organic electroluminescence display by the driving gear 500 and driving gear 500 of the 2nd example as a driving gear 200 is explained with reference to drawing 4 thru/or drawing 8 . A driving gear 500 has the capacity which indicates the organic EL panel 100 by multi-tone, and it explains it as what is displayed with k (k= 2) ****** =4 gradation of 2 in order to give explanation brief. In drawing 4 , a driving gear 500 consists of an anode plate driver 510 and a cathode driver 520. The anode plate driver 510 an organic EL panel 100 -- each -- with the output terminals OA1-OAm by which electrical installation is carried out to anode-rays A1 -Am Based on the high current control signal PC and k= 2-bit driving signal D1[1:0] -Dm[1:0], a high current or touch-down potential is supplied to each output terminals OA1-OAm during the blanking period during a scan. It has m output circuits 530 which supply the constant current or touch-down potential corresponding to gradation throughout [scan term] based on driving signal D1[1:0] -Dm [1:0]. The cathode driver 520 an organic EL panel 100 -- each -- it has the output terminals OC1-OCn by which electrical installation is carried out to cathode-rays C1 -Cn, and n output circuits 550 which supply the power-source potential VDD or touch-down potential to each output terminals OC1-OCn based on the scan signals S1-Sn. In addition, driving signal D1[1:0] -Dm[1:0] is serially supplied to the anode plate driver 510 from the exterior, is changed into parallel in the circuit which is not illustrated in the anode plate driver 510, and is supplied to an output circuit 530. Moreover, start signal ST and a blanking signal BL are supplied to the cathode driver 520 from the exterior, the level conversion of the scan signals S1-Sn is carried out, and they are supplied to an output circuit 550 while falling and the standup wave-like in a circuit which are not illustrated in the cathode driver 520 are changed into the sequential pulse which started with falling of a blanking signal BL, was alike, and synchronized, respectively. Only the output circuit 530 connected to the output terminal OA 1 shows the circuitry of each output circuit 530 to drawing 5 , only the output circuit 550 connected to the output terminal

OC 1 shows the circuitry of each output circuit 550 to drawing 4 , and other output circuits 530,550 are the same circuitry, and are omitting illustration.
[0028] The output circuit 530 connected to the output terminal OA 1 MOS transistor 531 for a P channel mold output to which k= 2-piece parallel connection of the CMOS configuration which supplies a high current, constant current, or touch-down potential was carried out as shown in drawing 5 (0), 531 (1) and MOS transistor 532 for an N channel mold output, MOS transistor 531 (0) and 531 (1), respectively Off control and high current control or the two PURIDORAIBA sections 533 for carrying out constant current control, It has the control section 534 which carries out logic processing of a driving signal D1 [1:0] and the high current control signal PC, carries out the level conversion of the logic signal, and is supplied to the gate and the PURIDORAIBA section 533 of MOS transistor 532. MOS transistor 531 (0) and 531 (1) are controlled based on a driving signal D1 [1:0] to be shown in drawing 6 , in order to supply the constant current IF0 (= 0), IF1, IF2, and IF3 and the high currents IL0 (= 0), IL1, IL2, and IL3 corresponding to 4 gradation from an output terminal OA 1. Namely, off control of MOS transistor 531 (0) and 531 (1) is carried out by driving signal D1 [1:0] = "00" at both the times of constant current IF 0 and a high current IL 0. the time of constant current IF 1 and a high current IL 1 -- driving signal D1 [1:0] = "01" -- MOS transistor 531 (0) -- constant current -- and high current control is carried out and off control of 531 (1) is carried out. MOS transistor 531 (0) carries out off control of the time of constant current IF 2 and a high current IL 2 by driving signal D1 [1:0] = "10" -- having -- 531 (1) -- constant current -- and high current control is carried out. the time of constant current IF 3 and a high current IL 3 -- driving signal D1 [1:0] = "11" -- MOS transistor 531 (0) and 531 (1) -- both -- constant current -- and high current control is carried out. MOS transistor 531 (0) and the current drive capacity of 531 (1) are designed by the magnitude of 1:2 when making it into IF2=2IF1 and IF3=3IF1. In order that the above [MOS transistor 531 (0) and 531 (1)] may control, the PURIDORAIBA section 533 connected to MOS transistor 531 (0) is driven based on the driving signal D1 of a lower bit (0) among driving signals D1 [1:0], and drives the PURIDORAIBA section 533 connected to MOS transistor 531 (1) based on the driving signal D1 of a high order bit (1) among driving signals D1 [1:0]. In order that each PURIDORAIBA section 533 may off-control and high current control MOS transistor 531 (0) and 531 (1), MOS transistor 531 (0), MOS transistor 535 for P channel mold control and MOS transistor 536 for N channel mold control of a CMOS configuration which connect the gate of 531 (1) to the power-source potential VDD and touch-down potential, In order to carry out constant current control of MOS transistor 531 (0) and 531 (1) MOS transistor 531 (0), It has the transfer gate 537 which connects the gate potential VG 1 of 531 (1) to a reference potential Vref, and the signal from a control section 434 is supplied to each gate of MOS transistor 535,536 and the transfer gate 537.
[0029] The output circuit 550 connected to the output terminal OC 1 has P channel mold MOS transistor 551 and N channel mold MOS transistor 552 of a CMOS inverter configuration which supply the power-source potential VDD and touch-down potential based on the scan signal S1, as shown in drawing 4 .
[0030] The drive approach of the organic EL panel 100 by the driving gear 500 is explained. From the exterior, start signal ST and a blanking signal BL are supplied to the cathode driver 520, and the high current control signal PC which has predetermined reversal pulse width narrower than the pulse width of driving signal D1[1:0] - Dm[1:0] and a blanking signal BL of 2 bits in the anode plate driver 510 is supplied. If start signal ST and a blanking signal BL are supplied to the cathode driver 520 from the exterior, from the circuit which is not illustrated in the cathode driver 520, the scan signals S1-Sn with which the standup and falling of pulse shape started with falling of a blanking signal BL, were alike with the signals, and synchronized, respectively will keep the same blanking period as the pulse width of a blanking signal BL in n output circuits 550, and will be supplied to line sequential. this time -- the anode plate driver 510 -- driving signal D1 [1:0] - Dm [driving signal D1[1:0] - Dm[1:0 changed into parallel in the circuit which will not be illustrated in the high current control signal PC and the anode plate driver 510 for every supply of the pulse of each scan signals S1-Sn including a blanking period if 1:0] and the high current control signal PC are supplied] is supplied to m output circuits 530, respectively.
[0031] Hereafter even the phase after being scanned from the phase before cathode rays C1 are scanned in the phase where cathode rays C1 are scanned, about actuation of the output circuit 530 connected to the output terminal OA 1, and the output circuit 550 connected to the output terminal OC 1 Drawing explaining the timing diagram of drawing 7 and the control state of each component of drawing 8 is used together and explained, assuming that it is what anode rays A1 drove by constant current IF 2, and anode rays A1 did not drive in the phase of order.
[0032] First, it is a scan phase (this side of time of day t1) by the cathode rays Cn in front of one in the line sequential by which cathode rays C1 are scanned, and in an output circuit 550, a blanking signal BL is "L" level, the scan signal S1 is touch-down potential level, and the output terminal OC 1 of MOS transistor 551 is [off control of ON control and MOS transistor 552 is carried out, and] power-source potential VDD level. In addition, at this time, an output terminal OCn is touch-down level, and output terminal OC2-OCn-1 other than the output terminals [OC and OCn] 1 is power-source potential VDD level. In this phase, it sets to an output circuit 530. Driving signal D1 [1:0] = "00", A driving signal D1 (0) and D1 (1) are ["L" level and the high current control

signal PC] "L" level. Namely, with the signal from a control section 534 Off control of ON control, and MOS transistor 536 and the transfer gate 537 is carried out for MOS transistor 535 of each PURIDORAIBA section 533. MOS transistor 531 (0), The gate potentials [VG / VG (0) and / 1] 1 (1) of 531 (1) on power-source potential VDD level Similarly, the gate potential VG 2 of MOS transistor 532 is power-source potential VDD level, ON control of off control and MOS transistor 532 is carried out for MOS transistor 531 (0) and 531 (1) by the signal from a control section 534, and an output terminal OA 1 is touch-down level. Therefore, reverse voltage VDD is supplied to an organic EL device E1, 1-E1, and n-1 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and the parasitic capacitance of an organic EL device E1, 1-E1, and n-1 is charged to hard flow.

[0033] Next, when time of day t1 comes, in an output circuit 550, a blanking signal BL changes to "H (yes)" level, and while off control of ON control and MOS transistor 552 was carried out for MOS transistor 551 with touch-down potential level, the output terminal OC 1 of the scan signal S1 is still power-source potential VDD level. In addition, output terminals OC2-OCn other than output terminal OC1 are also power-source potential VDD level at this time. While driving signal D1 [1:0] = "10" (0) D1, i.e., a driving signal, has been "L" level in an output circuit 530 in this phase Driving signal D1 (1) "H" level and the high current control signal PC change to "H" level. With the signal from a control section 534 MOS transistor 531 (1) Near MOS transistor 535 and the near transfer gate 537 of the PURIDORAIBA section 533 Off control, ON control of MOS transistor 536 is carried out, and the gate potential VG 1 (1) of MOS transistor 531 (1) changes to touch-down potential level. Similarly and with the signal from a control section 534 The gate potential VG 2 of MOS transistor 532 changes to touch-down potential level, and while the gate potential VG 1 (0) of MOS transistor 531 (0) has been power-source potential VDD level For high current control and MOS transistor 532, OFF control is carried out and MOS transistor 531 (1) is MOS transistor 531 (0). While it has been OFF control A high current IL 2 is supplied from an output terminal OA 1 through MOS transistor 531 (1) MOS transistor 531 (0) and among 531 (1). the parasitic capacitance of the organic EL device E1 charged to hard flow at this time, 1-E1, and n-1 -- the high current control signal PC -- period discharge of the period of "H" level, i.e., the pulse width of the high current control signal PC, -- it carries out. This pulse width is set up so that it may become low a little from the potential of the forward voltage VF2 of the organic EL device when driving by the constant current IF 2 to which the potential of an output terminal OA 1 can emit light by the brightness of a request of an organic EL device at the falling time of a pulse. Therefore, the parasitic capacitance of an organic EL device E1, 1-E1, and n is reverse-charged on the electrical potential difference [a little] higher than the difference of the power-source potential VDD and the potential of forward voltage VF2 at the falling time of this pulse.

[0034] When time of day t2 comes, a blanking signal BL next, in the state of "H" level In an output circuit 530, the high current control signal PC changes to "L" level. With the signal from a control section 534 MOS transistor 531 (1) While off control of MOS transistor 535,536 of the near PURIDORAIBA section 533 is carried out, ON control of the transfer gate 537 is carried out. The gate potential VG 1 (1) of MOS transistor 531 (1) changes to reference potential Vref level. While power-source potential VDD level and the gate potential VG 2 of MOS transistor 532 have been touch-down potential level, the gate potential VG 1 (0) of MOS transistor 531 (0) Constant current control of MOS transistor 531 (1) is carried out, and while MOS transistor 531 (0) and 532 have been OFF control, constant current IF 2 is supplied from an output terminal OA 1. At this time, the parasitic capacitance with which an organic EL device E1, 1-E1, and n were reverse-charged discharges slightly from the time of the high current control signal PC changing to "H" level to blanking period termination, it is at the blanking period termination time, and the potential of an output terminal OA 1 comes to spread the potential of the forward voltage VF2 of an organic EL device, abbreviation, etc. although a blanking period may be set up equally to the pulse width of the high current control signal PC, even if high current control of MOS transistor 531 (0) and 531 (1) should be carried out by the delay of a change on "L" level of the high current control signal PC by setting up somewhat longer than this pulse width -- organic EL device E -- a high current does not flow in the forward direction of the diode which constitutes the equal circuit of 1 and 1

[0035] If time of day t3 comes, in an output circuit 530, MOS transistor 531 (1) in next, constant current control and MOS transistor 531 (0), and the condition that off control of 532 is carried out In an output circuit 550, a blanking signal BL changes to "L" level. The scan signal S1 changes to power-source potential VDD level. MOS transistor 551 Off control, And ON control of MOS transistor 552 is carried out, and an output terminal OC 1 changes to touch-down potential level. Constant current IF 2 is supplied to 1 and 1. organic EL device [from an output terminal OA 1] E -- It discharges from the reverse charge condition that the parasitic capacitance of 1 and 1 is reverse-charged by the difference of the power-source potential VDD and the potential of forward voltage VF2. organic EL device E -- furthermore, it charges in the forward direction -- having -- organic EL device E -- if the forward voltage VF of the diode characteristics of 1 and 1 turns into the forward voltage VF2 which can emit light by desired brightness -- this organic EL device E -- 1 and 1 emit light by desired brightness. organic EL device E -- from the case where the parasitic capacitance of 1 and 1 supplies constant current from the condition reverse-charged with the power-source potential VDD, the starting time amount to luminescence

is short, and ends.

[0036] Next, if time of day t4 comes, in the scan phase according to the cathode rays C2 after one at the line sequential by which cathode rays C1 were scanned, in an output circuit 550, "H" level and the scan signal S1 will change to touch-down potential level, as for MOS transistor 551, off control of the blanking signal BL will be carried out, as for ON control and MOS transistor 552, and an output terminal OC 1 will change to power-source potential VDD level. In addition, at this time, an output terminal OC 2 is touch-down level, and an output terminal OC 1 and output terminals OC3-OCn other than OC2 are power-source potential VDD level. In this phase, it sets to an output circuit 530. Driving signal D1 [1:0] = "00", "L" level and the high current control signal PC change [a driving signal D1 (0) and D1 (1)] to "H" level. Namely, with the signal from a control section 534 Off control of ON control, and MOS transistor 536 and the transfer gate 537 is carried out for MOS transistor 535 of each PURIDORAIBA section 533. MOS transistor 531 (0), The gate potentials [VG / VG (0) and / 1] 1 (1) of 531 (1) are set to power-source potential VDD level. Similarly with the signal from a control section 534 The gate potential VG 2 of MOS transistor 532 is set to power-source potential VDD level. ON control of off control and MOS transistor 532 is carried out for MOS transistor 531 (0) and 531 (1), and touch-down potential supplies an output terminal OA 1 -- having -- organic EL device E -- reverse voltage VDD supplies 1 and 1 -- having -- organic EL device E -- 1 and 1 stop luminescence. Reverse voltage VDD is supplied except an organic EL device E1 and 2 among the organic EL device E1 connected to anode rays A1 at this time, 1-E1, and n, and those parasitic capacitance is charged to hard flow.

[0037] The pulse width of the above-mentioned high current control signal PC in addition, at the falling time of a pulse When it sets up so that the parasitic capacitance of the organic EL device E1 charged to hard flow, 1-E1, and n may discharge completely and the potential of an output terminal OA 1 may be set to power-source potential VDD level, in the scan phase by cathode rays C1 When an output terminal OC 1 changes to touch-down potential level, the potential of the both ends of an organic EL device E1, 2-E1, and n is power-source potential VDD level. The parasitic capacitance of 1 and 1 is charged in the forward direction. this time -- organic EL device E -- constant current IF 2 supplies 1 and 1 -- having -- this constant current IF 2 -- organic EL device E -- organic EL device E, although the forward voltage VF of the diode characteristics of 1 and 1 tends to turn into the forward voltage VF2 which can emit light by desired brightness The parasitic capacitance of an organic EL device E1, 2-E1, and n is reverse-charged on the electrical potential difference of the difference of power-source potential VDD level and forward voltage VF2 until the potential of an output terminal OA 1 turns into potential of forward voltage VF2. At this time organic EL device E -- 1 and 1 -- this current -- flowing -- organic EL device E -- a two or more constant current [IF] current cannot flow, and 1 and 1 cannot be driven by constant current IF 2. therefore -- above -- a blanking period termination time -- it is -- the potential of an output terminal OA 1 -- the potential of the forward voltage VF2 of an organic EL device, and abbreviation -- if the pulse width of the high current control signal PC is set up so that it may become equal -- organic EL device E -- 1 and 1 can be driven by constant current IF 2, and they can emit light by desired brightness.

[0038] the above actuation -- organic EL device E, although only the actuation which emits light and stops [luminescence] 1 and 1 was explained It operates similarly about other organic EL devices. As an organic EL panel 100 While repeating the scan of cathode rays C1-Cn to line sequential at high speed, by driving the anode rays of arbitration based on 2-bit driving signal D1[1:0] -Dm[1:0] for every scan among anode rays A1-Am Each organic EL device of two or more locations of arbitration is operated as if it was emitting light to coincidence.

[0039] In the 1st and 2nd examples of the above, in addition, the initiation time of the drive by the high current Although the case of being the same as that of the initiation time of each blanking period was explained at the last scan period to the anode rays which were not driven by constant current among the anode rays driven by constant current at the scan period immediately after each blanking period When a high current drive is similarly carried out to the anode rays driven by constant current at the last scan period, the potential of the anode rays driven by constant current at the last scan period By being at the initiation time of a blanking period, being the potential when driving by constant current at the last scan period, and carrying out a high current drive further Until the potential of these anode rays turns into potential when driving by constant current from power-source potential, when it becomes power-source potential and drives by constant current at the scan period immediately after a blanking period From the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays The influx of the current to the organic EL device connected to the cathode rays scanned can arise, the current beyond constant current can flow to an organic EL device, and an organic EL device cannot be made to emit light by desired brightness. In order to solve this fault, you may make it drive the drive by the high current by the drive period in this high current, and constant current to a deed and the anode rays which drove by constant current at the last scan period only to the anode rays which were not driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period. As opposed to the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period when doing in this way Since it does not drive by the

high current but drives by constant current, it is at the termination time of a blanking period. When it is only going up slightly and the potential of these anode rays is driven by constant current at the scan period immediately after a blanking period, There is no influx of the current to the organic EL device connected to the cathode rays scanned from the parasitic capacitance of the organic EL device connected to the cathode rays which are not scanned among the organic EL devices connected to these anode rays, and an organic EL device can be driven by constant current, and can emit light by desired brightness.

[0040] Moreover, the initiation time of the drive by the high current is not made the same as that of the initiation time of each blanking period, but once it is at the initiation time of each blanking period and makes into touch-down potential potential of the anode rays driven by constant current at the scan period immediately after each blanking period, the drive by the high current may be started. If it does in this way, it will be the potential of the anode rays driven by constant current at the last scan period among the anode rays driven by constant current at the scan period immediately after each blanking period at the initiation time of each blanking period. Since the parasitic capacitance of the organic EL device which became touch-down potential and was once connected to these anode rays is reverse-charged like the parasitic capacitance of the organic EL device connected to the anode rays which were not driven by constant current at the last scan period, The drive by the subsequent high current can be performed on these conditions to both anode rays.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The circuit diagram of the driving gear of the organic electroluminescence display which is the 1st example of this invention.
[Drawing 2] The timing chart explaining actuation of the driving gear of drawing 1 .
[Drawing 3] Drawing explaining the control state of the transistor contained in the driving gear of drawing 1 , and the transfer gate.
[Drawing 4] The circuit diagram of the driving gear of the organic electroluminescence display which is the 2nd example of this invention.
[Drawing 5] The circuit diagram of the output circuit of the anode plate driver of the driving gear of drawing 4 .
[Drawing 6] The transistor 531 (0) contained in the output circuit of drawing 5 , drawing explaining the control state by the driving signal of 531 (1).
[Drawing 7] The timing chart explaining actuation of the driving gear of drawing 4 .
[Drawing 8] Drawing explaining the control state of the transistor contained in the driving gear of drawing 4 , and the transfer gate.
[Drawing 9] The outline block diagram of an organic electroluminescence display
[Drawing 10] The circuit diagram of the driving gear of the conventional organic electroluminescence display.
[Drawing 11] The timing chart explaining actuation of the driving gear of drawing 10 .
[Description of Notations]
400,500 Driving gear
410 510 Anode plate driver
420 520 Cathode driver
430 530 Output circuit of an anode plate driver
431, 531 (0), 531 (1) MOS transistor for a P channel mold output
432 532 MOS transistor for an N channel mold output
433 533 PURIDORAIBA section
434 534 Control section
435 535 MOS transistor for P channel mold control
436 536 MOS transistor for N channel mold control
437 537 Transfer gate

[Translation done.]

* NOTICES *

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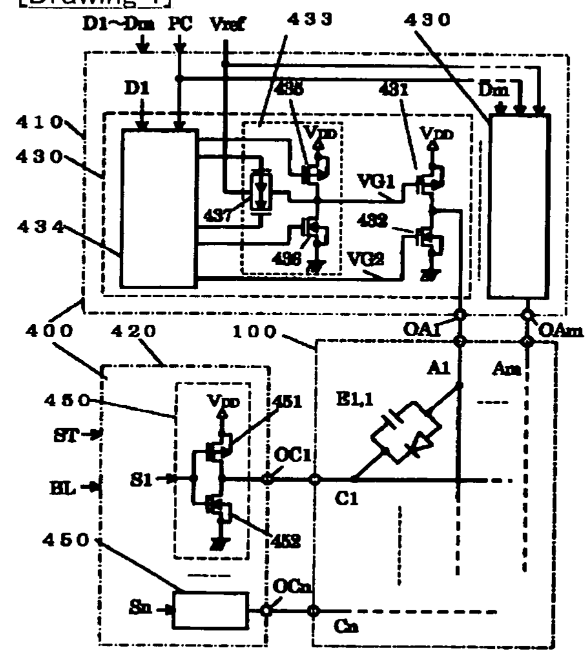
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

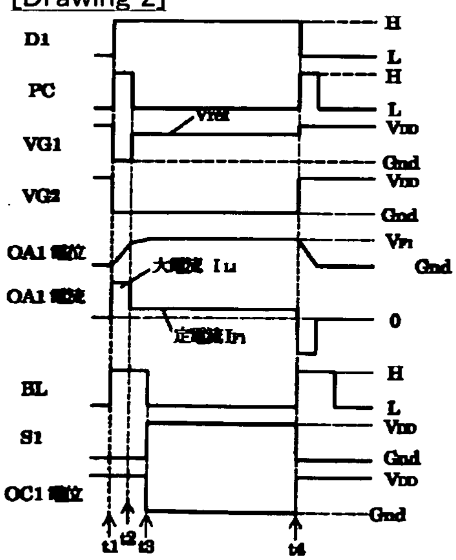
[Drawing 3]

素子No.	451	452	435	436	437	431	432
t1の手前	ON	OFF	ON	OFF	OFF	OFF	ON
t1−t2	ON	OFF	OFF	ON	OFF	大電流	OFF
t2−t3	ON	OFF	OFF	OFF	ON	定電流	OFF
t3−t4	OFF	ON	OFF	OFF	ON	定電流	OFF
t4の後	ON	OFF	ON	OFF	OFF	OFF	ON

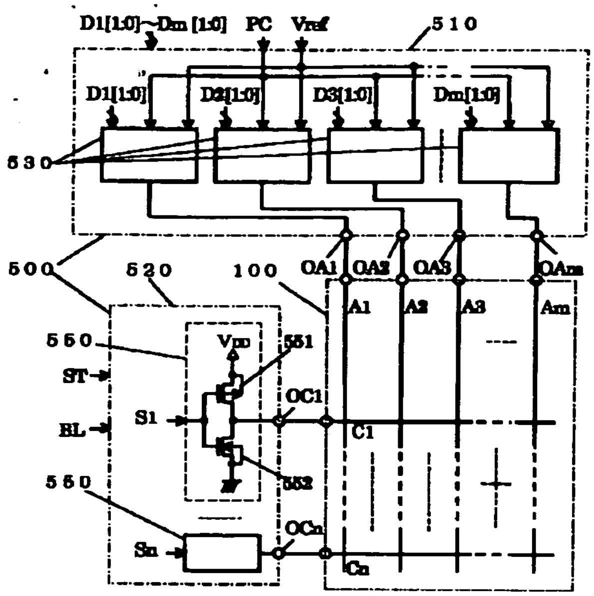
[Drawing 1]



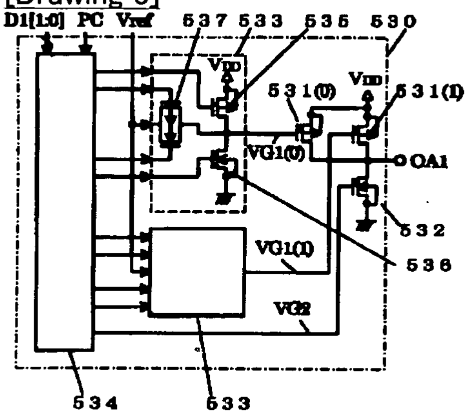
[Drawing 2]



[Drawing 4]



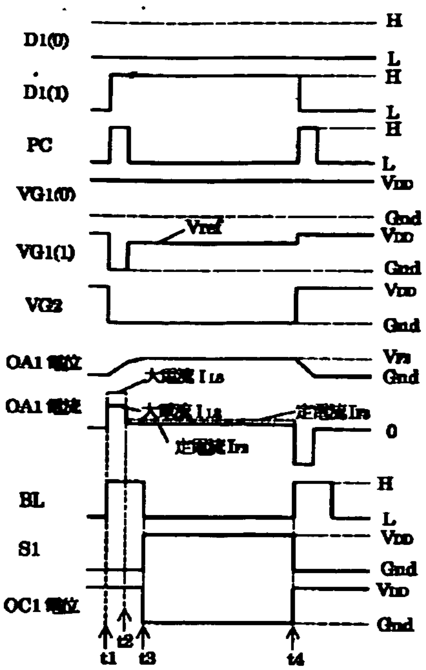
[Drawing 5]



[Drawing 6]

D1[1:0]	"00"		"01"		"10"		"11"	
定電流	IF0=0		IF1		IF2		IF3	
素子No.	531(1)	531(0)	531(1)	531(0)	531(1)	531(0)	531(1)	531(0)
	OFF	OFF	OFF	定電流	定電流	OFF	定電流	定電流
大電流	IL0=0		IL1		IL2		IL3	
素子No.	531(1)	531(0)	531(1)	531(0)	531(1)	531(0)	531(1)	531(0)
	OFF	OFF	OFF	大電流	大電流	OFF	大電流	大電流

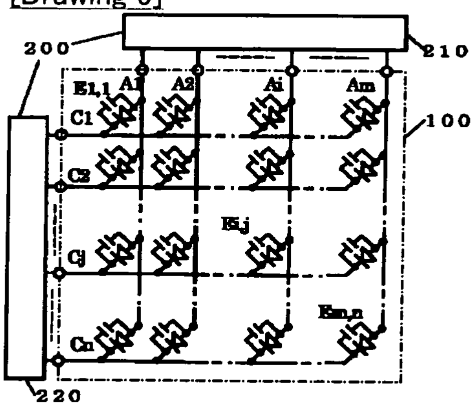
[Drawing 7]



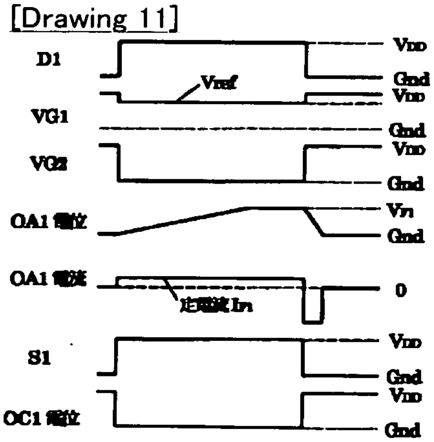
[Drawing 8]

			531(1)側			531(0)側					
素子No.	551	552	535	536	537	535	536	537	531(1)	531(0)	532
t1の手前	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
t1−t2	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	大電流	OFF	OFF
t2−t3	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	定電流	OFF	OFF
t3−t4	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	定電流	OFF	OFF
t4の後	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON

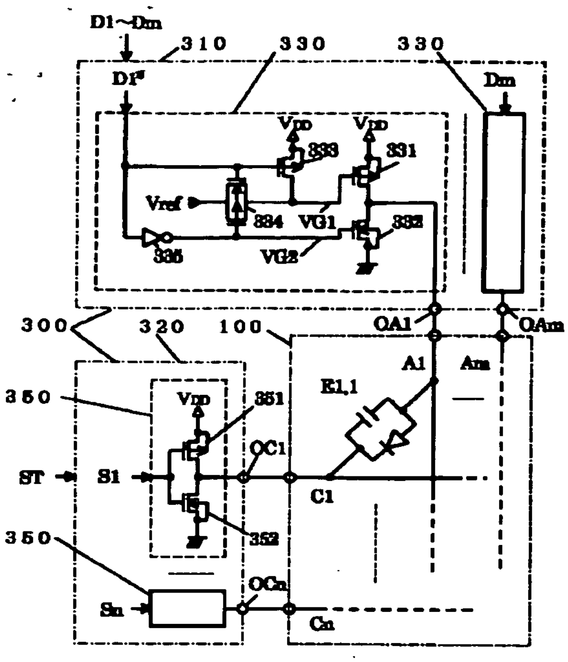
[Drawing 9]



[Drawing 11]



[Drawing 10]



[Translation done.]